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The Printer Working Group (PWG)

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Proposed Standard for

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The Internet Printing Protocol (IPP):

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Document Object

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A Program of the IEEE-ISTO
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Version 0.5, October 25, 2002

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

Version 0.5, October 25, 2002

Abstract: This IPP specification extends the IPP Model and Semantics [RFC2911] object model by defining a Document object. The [RFC2911] Job object is extended to contain one or more Document objects which are passive objects operated on by the Job. The Document object is created by the [RFC2911] Send-Document and Send-URI operations and represents an Input Document to the Job. This specification also adds a Document Attributes group (and tag) to these Send-Document and Send-URI requests. The Document Attributes group contains any Document Template attributes to be applied to this Document object being created, overriding any corresponding Job Template attribute supplied at the job level (including the "document-overrides" operation attributes at the Job or Document level). A new Create-Document operation allows a client to supply the Document Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content to that Document object using the new Send-Data operation. The client can also supply Document Attributes with the existing Send-Document and Send-URI operations to create Document objects with content data or a document reference, respectively.

This specification also defines seven new operations for Document objects once they have been created: Cancel-Current-Document, Cancel-Document, Get-Document-Attributes, Get-Documents, Delete-Document, Set-Document-Attributes, and Validate-Document.

This specification also lists all of the attributes defined in other IPP specifications to show their relationship to corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the "document-state", "document-state-reasons", and "document-state-message" Document Description attributes are given along side of the corresponding [RFC2911] "job-state", "job-state-reasons", and "job-state-message" Job Description attributes.

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

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

ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/pwg-ipp-document-object-v05-021025.pdf, .doc, .rtf

This document is an IEEE-ISTO PWG Proposed standard. For a definition of a "PWG Proposed Standard" and its transition to a "PWG Draft Standard", see: ftp://ftp.pwg.org/pub/pwg/general/pwg-process.pdf. After approval by the PWG (by a Last Call) to transition this Proposed Standard to a Draft Standard, an IEEE-ISTO number will be assigned and this PWG Draft Standard will be available electronically at:

ftp://ftp.pwg.org/pub/pwg/standards/

91 **About the IEEE-ISTO**
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93 The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum
94 and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities
95 that support the implementation and acceptance of standards in the marketplace. The organization is affiliated with
96 the IEEE (http://www.ieee.org/) and the IEEE Standards Association (http://standards.ieee.org/).
97
98 For additional information regarding the IEEE-ISTO and its industry programs visit http://www.ieee-isto.org.
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101 **About the IEEE-ISTO PWG**

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

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

114 For additional information regarding the Printer Working Group visit: http://www.pwg.org
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116

117 **Contact information:**

118   IPP Web Page: http://www.pwg.org/ipp/
119   IPP Mailing List: ipp@pwg.org

120 To subscribe to the ipp mailing list, send the following email:
121   1) send it to majordomo@pwg.org
122   2) leave the subject line blank
123   3) put the following two lines in the message body:
124   subscribe ipp
125   end

126 Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
127 discussions of clarifications or review of registration proposals for additional names. Requests for additional media
128 names, for inclusion in this specification, should be sent to the IPP Mailing list for consideration.
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1   Introduction and Summary

268   This IPP specification extends the IPP Model and Semantics [RFC2911] object model by defining a Document
269   object. The [RFC2911] Job object is extended to contain one or more Document objects which are passive objects
270   operated on by the Job. The Document object is created by the [RFC2911] Send-Document and Send-URI
271   operations and represents an Input Document to the Job. This specification also adds a Document Attributes group
272   (and tag) to these Send-Document and Send-URI requests. The Document Attributes group contains any Document
273   Template attributes to be applied to this Document object being created, overriding any corresponding Job Template
274   attribute supplied at the job level (including the "document-overrides" operation attributes at the Job or Document
275   level). A new Create-Document operation allows a client to supply the Document Attributes without the data (like
276   Create-Job does for a Job object). Then the client can send the data content to that Document object using the new
277   Send-Data operation.

278   This specification also defines seven new operations for Document objects once they have been created: Cancel-
279   Current-Document, Cancel-Document, Get-Document-Attributes, Get-Documents, Delete-Document, Set-Document-
280   Attributes, and Validate-Document.

281   This specification also lists all of the attributes defined in other IPP specifications to show their relationship to
282   corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the
283   "document-state", "document-state-reasons", and "document-state-message" Document Description attributes are
284   given along side of the corresponding [RFC2911] "job-state", "job-state-reasons", and "job-state-message" Job
285   Description attributes.

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

1.1   Scope

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

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

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[1] 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.

301   **Table 1 - List of Document operations**

Operation Name	Printer support	Brief Description
Create-Document[2]	REQUIRED	Creates a Document object with Document attributes, but no data.
Send-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).
Validate-Document	REQUIRED	Validate that the supplied Document attributes are supported.
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.
Cancel-Current-Document	OPTIONAL	Cancel the current document that the Printer is printing.
Delete-Document	OPTIONAL	Remove the specified Document object and its data from the Job.

302   * The existing IPP/1.1 operations defined in [RFC2911] with an extension so the client can supply Document
303   Template attributes in a new attribute Group in the request.
304   This specification also specifies the life cycle of the Document object by defining the "document-state", "document-
305   state-reasons", and "document-state-message" attributes. Finally, the analogous Document Descriptions attributes
306   that correspond to the Job Description attributes are defined.

307 # 2   Terminology

308   This section defines terminology used throughout this document.

309 ## 2.1   Conformance Terminology

310   Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY, NEED NOT,** and
311   **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [RFC2119] and [RFC2911]
312   section 12.1. If an implementation supports the extension defined in this document, then these terms apply;
313   otherwise, they do not. These terms define conformance to *this document (and [RFC2911]) only*; they do not affect
314   conformance to other documents, unless explicitly stated otherwise. To be more specific:

315   **REQUIRED** - an adjective used to indicate that a conforming IPP Printer implementation MUST support the indicated
316   operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. See
317   [RFC2911] "Appendix A - Terminology for a definition of "support". *Since support of this entire Document Object*
318   *specification is OPTIONAL for conformance to IPP/1.1, the use of the term REQUIRED in this document means*
319   *"REQUIRED if this OPTIONAL Document Object specification is implemented".*

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

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

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

328　**2.2　Other Terminology**

329　This document uses the same terminology as [RFC2911], such as "**client**", "**Printer**", "**attribute**", "**attribute value**",
330　"**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", "**response**", and "**support**"
331　with the same meaning. In addition, the following terms are defined for use in this document:

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

334　**Job Creation operation** - operations that create Job objects, specifically: Print-Job, Print-URI, and Create-Job as
335　defined in [RFC2911].

336　**Document Creation operation** - operations that create Document objects. Specifically: Create-Document, Print-
337　Job, Print-URI, Send-Document and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and
338　**Document Creation** operations, since they create both Job and a **Document object** at the same time. Also this
339　specification does not extend the Print-Job and Print-URI operations. However, this specification does extend the
340　Send-Document and Send-URI operations to allow the client to supply **Document Template** attributes in each
341　request.

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

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

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

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

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

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

362　Table 2 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job
363　Creation operations and Document Creation operations, though they only create single Document jobs. In other
364　words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
365　submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a

366 separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept,
367 no operation supplies attributes at more than one level.[3]

368   **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		
yes	yes	**Print-Job**	Job attributes and Document attributes		Job Level
yes	yes	**Print-URI**	Job attributes and Document attributes		
	yes	**Create-Document**		Document attributes	
	yes	**Send-Document**		Document attributes	Document Level
	yes	**Send-URI**		Document attributes	

369

370 **Document Overrides** - a way for a client to specify attributes to apply to specified documents in a multi-document
371 job. Specifically, as member attributes of the "document-overrides" **Job Template attribute** in a **Job Creation**
372 operation or the "document-overrides" **operation attribute** in a **Document Creation operation** as defined in
373 [override]. Note: The **Document Template attributes** supplied in a Create-Document, Send-Document, or Send-
374 URI operation also "override" any Document Template attributes supplied in the Job Creation operation.

375 **3 Document Operations**

376 The Document object semantics are as parallel to the Job object semantics as possible. Therefore, most of the Job
377 operations have analogous Document operations as shown in Table 14 in section "Appendix A: Document operations
378 compared to Job operations". Operations that can apply only to an entire job, have no analogous document
379 operation as indicated. This extension adds 8 new Document operations that operate on the Document object once
380 it is created by the new Create-Document operation or either of the existing two operations: Send-Document and
381 Send-URI operations.

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

384 The signatures of the operation requests that create and/or validate Document objects are very similar as shown in
385 Table 3 and defined in section 3.1 through section 3.5. The entries in the table show what a client MUST, MAY, or
386 MUST NOT supply in the indicated operation requests.

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[3] 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 State and Document State attributes (instead of Description attributes).

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

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

388

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

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

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

392

393 **3.1 Create-Document Operation**

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

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

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

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

406   2.   MUST support the "multiple-operation-time-out" Printer Description attribute (see [RFC2911] section 4.4.31).

407 3. MUST support the "multiple-document-jobs-supported" Printer Description attribute (see [RFC2911] section
408   4.4.16) with a 'true' value, that is the Printer MUST support multiple document jobs.

409 4. MUST support the "multiple-document-handling" Job Template job attribute with at least one value (see
410   [RFC2911] section 4.2.4) and the associated "multiple-document-handling-default" and "multiple-document-
411   handling-supported" Job Template Printer attributes (see [RFC2911] section 4.2).

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

414 The Printer sets the value of the Document's "document-state" Document Description attribute to 'pending', if the
415 Printer accepts the Create-Document request. A Printer MAY set the 'job-data-insufficient' value of the Document's
416 "document-state-reason" Document Description attribute to indicate that processing cannot begin until sufficient data
417 has arrived and set the "document-state" to 'pending'. A non-spooling printer that doesn't implement the 'pending'
418 document state may even set the "document-state" to 'processing', even though there is not yet any data to process.
419 See sections 8.5 and 8.7.

420 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
421 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see
422 [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden',
423 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

424 3.1.1 Create-Document Request

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

426 **Group 1: Operation Attributes**

427 **Natural Language and Character Set:**
428   First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes
429   as described in [RFC2911] section 3.1.4.1. The Printer object MUST copy these values to the corresponding
430   Job Description attributes described in [RFC2911] sections 4.3.19 and 4.3.20.

431 **Target:**
432   Next, the client MUST supply either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri"
433   (uri) operation attribute(s) which define the target Job object for this operation as described in [RFC2911]
434   section 3.1.5. The client MAY supply the remaining Operation attributes in any order following:

435 **Requesting User Name:**
436   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
437   [RFC2911] section 8.3.

438 **3.1.1.1 input-document-number (integer(1:MAX))**   **operation attribute**

439   The client MAY supply the "input-document-number" Operation attribute to indicate which Document object
440   in the Job to which this Create-Document request is to apply. If the Printer supports this attribute, the Printer
441   MUST also support the corresponding "document-number" (text(127)) Document Description attribute (see
442   section 8.1) and copy this value to the "document-number" Document Description attribute. Usually the
443   client omits this Operation attribute, so that the Printer assigns the next integer value starting at 1 for each
444   Job. A client that is creating multiple Document objects in parallel MAY wish to supply this attribute in order
445   to control the order of the Documents in the job. If supplied, the Printer MUST copy the value to the
446   Document object's "document-number" Document Description attribute. If the Job already contains a
447   Document with the same "document-number" value as the one supplied by this attribute, the Printer MUST

448   reject the request and return the 'client-error-client-error-conflicting-attributes (see [RFC2911] section
449   13.1.4.15) and the "input-document-number" and "document-number" attributes.

450   **3.1.1.2 last-document (boolean)**   **operation attribute**

451   The client MUST supply this attribute (as in the Send-Document and Send-URI operation requests). The
452   Printer object MUST support this attribute. This attribute is a boolean flag that the client supplies with a 'true'
453   value if this is the last document for the Job, 'false' otherwise.

454   **3.1.1.3 document-message (text(127))**   **operation attribute**

455   The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
456   support the corresponding "document-message" (text(127)) Document Description attribute (see section
457   8.10) and copy this value to the "document-message" Document Description attribute. The end user can use
458   this Document Description attribute as a message to the operator and the operator can use it as a message
459   to the user. The Printer MAY print this message on a document start sheet for this document, if any.

460   **3.1.1.4 Additional Operation attributes:**

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

468   **Group 2: Document Template Attributes**

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

477   If the client is not supplying any Document Template attributes in the request, the client SHOULD omit Group
478   2 rather than sending an empty group. However, a Printer object MUST be able to accept an empty group.

479   The client MUST NOT supply the document data in this operation request. See Send-Data operation.

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

482   In addition to the MANDATORY parameters required for every operation request (see [RFC2911]), the simplest
483   Create-Document request consists of just the "attributes-charset" and "attributes-natural-language" operation
484   attributes; either (1) the "printer-uri" target operation attribute and the "job-id" or (2) the "job-uri" and nothing else. In
485   this simple case, the Printer object:

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

487   - assigns the lowest document number not yet used by this Job, if the client did not supply an "input-document-
488   number" operation attribute (see section 3.1.1.1). Copy the document number assigned or supplied to the
489   Document object's "document-number" Document Description attribute.

490   - stores a generated Document name in the "document-name" Document Description attribute in the natural
491   language and charset requested (see [RFC2911] section 3.1.4.1) (if those are supported, otherwise using
492   the Printer object's default natural language and charset), and

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

3.1.2 Create-Document Response

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

498 **Group 1: Operation Attributes**

499 **Status Message:**
500   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
501   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
502   in [RFC2911] sections 13 and 3.1.6.

503   The Printer MUST reject the operation:

504   If the client supplies the "ipp-attribute-fidelity" operation attribute (see section 6.2.1) with a 'true'
505   value and the client supplies any unsupported and/or conflicting Job Template or Document
506   Template attributes.

507   If the client omits or supplies the "ipp-attribute-fidelity" operation attribute (section 6.2.3) with a 'false'
508   value and supplies keyword values of the "document-mandatory-attributes" operation attribute that
509   are unsupported and/or conflicting.

510   Otherwise, the Printer MUST accept the operation and ignore or substitute unsupported and/or conflicting
511   attribute values supplied by the client. See the Implementer's Guide [RFC3196] for a complete description of
512   the suggested steps for processing the attributes in a create request.

513 **Natural Language and Character Set:**
514   The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
515   3.1.4.2.

516 **Group 2: Unsupported Attributes**

517   See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

518   The value of the "ipp-attribute-fidelity" and "document-mandatory-attributes" operation attributes supplied by
519   the client does not affect what attributes the Printer object returns in this group. The value of these two
520   operation attributes only affects whether the Create-Job operation is accepted or rejected. If the Document
521   is accepted, the client may query the Document object using the Get-Document-Attributes operation (see
522   section 3.5) requesting the unsupported attributes that were returned in the create response to see which
523   attributes were ignored (not stored on the Document object) and which attributes were stored with other
524   (substituted) values.

525   **Group 3: Job Object Attributes**

526   In addition, the Printer MUST return the same Job status attributes that [RFC2911] REQUIRES for the Send-
527   Document and Send-URI operation responses (which are the same as for the Print-Job response -
528   [RFC2911] section 3.2.1.2):

529   "job-uri" (uri) - see [RFC2911] section 4.3.1
530   "job-id" (integer(1:MAX)) - see [RFC2911] section 4.3.2
531   "job-state" (type1 enum) - see [RFC2911] section 4.3.7
532   "job-state-reasons" (1setOf type2 keyword) - see [RFC2911] section 4.3.8
533
534   The Printer MAY return:

535   "job-state-message" (text(MAX)) - see [RFC2911] section 4.3.9
536   "number-of-intervening-jobs" (integer(0:MAX)) - see [RFC2911] section 4.3.15
537
538   **Group 4: Document Object Attributes**

539   **3.1.2.1 document-number (integer(1:MAX))**   **Document Description attribute**

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

542   **3.1.2.2 document-id-uri (uri)**   **Document Description attribute**

543   The Printer MUST return the document id of this Document object as a URI as assigned by the Printer (see
544   section 8.2).

545   **3.1.2.3 document-state (type1 enum)**   **Document Description attribute**

546   The Printer MUST return the state of this Document object (see section 8.5).

547   **3.1.2.4 document-state-reasons (1setOf type2 keyword)**   **Document Description attribute**

548   The Printer MUST return the associated state reasons for this Document (see section 8.7).

549   **3.1.2.5 document-state-message (text(MAX))**   **Document Description attribute**

550   The Printer MAY return the localized description of the "document-state" and "document-state-reasons"
551   values for this Document (see section 8.9).

552   ## 3.2 Send-Data Operation

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

556   Since the Create-Document and the Send-Data operation that follows could occur over an arbitrarily long period of
557   time for a particular Document, a client MUST send the Send-Data operation within an IPP Printer defined minimum
558   time interval after the receipt of the previous request for the job. If a Printer object supports the Document object, the
559   Printer object MUST support the "multiple-operation-time-out" attribute (see [RFC2911] section 4.4.31). This
560   attribute indicates the minimum number of seconds the Printer object will wait for the next send operation before
561   taking some recovery action. See the description under Send-Document in [RFC2911] section 3.3.1, for the possible
562   Printer actions, if the client does not supply a Send-Data request in time.

563 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
564 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see
565 [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden',
566 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

3.2.1 Send-Data request

567

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

569 **Group 1: Operation Attributes**

570   **Natural Language and Character Set:**
571   The "attributes-charset" and "attributes-natural-language" attributes as described in section [RFC2911]
572   3.1.4.1.

573   **Target:**
574   The "document-number" (integer(1:MAX)) operation attribute MUST be supplied immediately after either (1)
575   the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) and "operation attribute(s) which
576   define the target Document object for this operation as described in section [RFC2911] 3.1.5. If the client
577   omits the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-
578   error-bad-request' status code.

579   **Requesting User Name:**
580   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
581   [RFC2911] section 8.3.

582 **Group 2: Document Content**

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

3.2.2 Send-Data Response

585

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

587 **Group 1: Operation Attributes**

588   **Status Message:**
589   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
590   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
591   in [RFC2911] sections 13 and 3.1.6.

592   **Natural Language and Character Set:**
593   The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
594   3.1.4.2.

595 **Group 2: Unsupported Attributes**

596   See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

597 **Group 3: Job Object Attributes**

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

600   **Group 4: Document Object Attributes**

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

603   ISSUE 01: OK for the Send-Data operation to return Document status attributes (as well as Job status
604   attributes) so at to be like the other Document operations?

605   3.3 Send-Document Operation

606   This REQUIRED[4] operation allows a client to submit multiple documents in a single Job by making a Send-Document
607   request for each Document. In this specification, the Send-Document creates a Document object ([RFC2911] did not
608   have a Document object). A Printer MUST support this operation with the semantics specified in [RFC2911] and with
609   the extension defined in this specification, since this specification REQUIRES the Printer to support multiple
610   document jobs.

611   See [RFC2911] section 3.3.1 for the semantics of the Send-Document operation not reproduced here.

612   *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
613   owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see
614   [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden',
615   'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

616   3.3.1 Send-Document Request

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

618   **Group 1: Operation Attributes (as in [RFC2911])**

619   As specified in [RFC2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 6.
620   For example, "compression", "document-format", and "document-name". So this group is the same as for
621   Create-Document (see section 3.1.1).

622   **Group 2: Document Attributes (new - not in [RFC2911])**

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

627   **Group 3: Document Content (as in [RFC2911] Group 2)**

628   The client MUST supply the document data in-line to be processed for this Document if the "last-document"
629   flag is set to 'false'. However, since a client might not know that the previous Document object created with a
630   Create-Job, Send-Document, or Send-URI operation was the last document (i.e., the "last-document"
631   attribute was set to 'false'), it is legal to send a Send-Document request with no document data where the
632   "last-document" flag is set to 'true'. For this case, the Printer MUST NOT increment the value of the Job
633   object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is
634   not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and

---

[4] 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.

635 Send-Document request with a "last-document" operation attribute set to 'true' with no document data; it is
636 only an empty job which is scheduled and processed normally.

637 3.3.2 Send-Document Response

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

639 Group 1: Operation Attributes (as in [RFC2911] Group 1)

640 Status Message:
641 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
642 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
643 in [RFC2911] sections 13 and 3.1.6.

644 Natural Language and Character Set:
645 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
646 3.1.4.2.

647 Group 2: Unsupported Attributes (as in [RFC2911] Group 2)

648 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

649 Group 3: Job Object Attributes (as in [RFC2911] Group 3)

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

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

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

655 3.4 Send-URI Operation

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

663 If a Printer object supports this operation, it MUST also support the Print-URI operation (see [RFC2911] section
664 3.2.2).

665 The Printer object MUST validate the syntax and URI scheme of the supplied URI before returning a response, just
666 as in the Print-URI operation. The IPP Printer MAY validate the accessibility of the document as part of the operation
667 or subsequently (see [RFC2911] section 3.2.2).

668 ## 3.5 Validate-Document Operation

669 This REQUIRED operation allows the client to verify capabilities of a Printer against whatever attributes the client
670 supplies in the Validate-Document request in combination with the previously submitted partial Job, if any. This
671 operation has the same inputs as the Create-Document operation request (section 3.1) except the Printer does not
672 create a new Document object. The Printer object returns the same status codes, Operation Attributes (Group 1)
673 and Unsupported Attributes (Group 2) as the Create-Document operation (see section 3.1.2). However, no Job
674 Object Attributes (Group 3) and no Document Object Attributes (Group 4) are returned, since no Document object is
675 created.

676 The client MAY supply a Job object Target, that MUST be either (1) a "printer-uri" and a "job-id" operation attribute or
677 (2) a "job-uri" operation attribute. If supplied, the Job Target MUST identify a job that has been created by Create-
678 Job ([RFC2911] section 3.2.4), but not yet closed, that is, the client hasn't yet supplied the "last-document" operation
679 attribute with a 'true' value. When the client supplies the Job object Target, the Printer MUST validate that an
680 identical Create-Document, Send-Document, or Send-URI operation would have been accepted in the context of the
681 specified Job and its other Document objects.

682 If the client omits the Job Target by including only the "printer-uri" operation attribute, the Printer performs the same
683 validation as for a Create-Document in which there were no Job attributes supplied in the Create-Job and no other
684 Documents. The Printer MUST support the Validate-Document operation with and without the Job object Target
685 being present.

686 In addition to the attributes and groups defined for a Create-Document request (see section 3.1.1), the client MAY
687 supply the "document-uri" operation attribute (defined in the Send-URI operation in [RFC2911] section 3.3.2). If the
688 client supplies the "document-uri" operation attribute, the Printer MUST validate that the URI scheme is supported
689 and that the referenced data is accessible[5].

690 If the client discovers that a Validate-Document operation fails, it has the choice of (1) canceling the entire partially
691 created job, if any, (2) closing the partially created Job as is (with a Send-Document supplying the "last-document"
692 with a 'true' value) so that the Printer will process the Job, or (3) adding other Document objects (with Create-
693 Document, Send-Document, and/or Send-URI) and then closing the Job.

694 By using the Validate-Document operation a client can validate that an identical Create-Document operation (or a
695 Send-Document operation with the document data or a Send-URI operation) would be accepted by the Printer in the
696 context of the partially submitted Job. The Validate-Document operation also performs the same security negotiation
697 as the Create-Document operation (see [RFC2911[section 8), so that a client can check that the client and Printer
698 object security requirements can be met before performing a Create-Document, Send-Document, or Send-URI
699 operation.

700 ## 3.6 Get-Document-Attributes Operation

701 This REQUIRED operation allows a client to request the values of selected attributes of a Document object. This
702 operation is almost identical to the Get-Job-Attributes operation (see [RFC2911] section 3.3.4). The only differences
703 are that the operation is directed at a Document object rather than a Job object and the returned attribute group is a
704 set of Document object attributes rather than a set of Job object attributes.

705 The Printer MUST return the attributes that a client supplied in the Create-Document, Send-Document, or Send-URI
706 operations, plus any Document Description attributes that the Printer has generated. The Printer MUST NOT return
707 any Job Level attributes that the Document object inherits, including "document-overrides" (1setOf collection)
708 member attributes (see [override]), and MUST NOT factor out common Document object attributes and return them

---

[5] The PWG PSI [pwg-psi] specification includes a Validate-Document operation with the "document-uri" operation
attribute that the Printer MUST validate.

709 as Job object attributes. Thus the Get-Document-Attributes returns to clients the attributes that clients submitted with
710 the Job object and with the Document object.

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

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

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

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

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

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

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

731 3.6.1 Get-Document-Attributes Request

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

734 **Group 1: Operation Attributes**

735 **Natural Language and Character Set:**
736   The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
737   3.1.4.1.

738 **Target:**
739   The "document-number" (integer(1:MAX)) operation attribute MUST be supplied immediately after either (1)
740   the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which define
741   the target Document object for this operation as described in [RFC2911] section 3.1.5. If the client omits the
742   "document-number" operation attribute, the Printer MUST reject the request and return the 'client-error-bad-
743   request' status code.

744 **Requesting User Name:**
745   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
746   [RFC2911] section 8.3.

747   **3.6.1.1 "requested-attributes" (1setOf keyword):**

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

751   **3.6.2 Get-Document-Attributes Response**

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

753   **Group 1: Operation Attributes**

754   **Status Message:**
755   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
756   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
757   in [RFC2911] sections 13 and 3.1.6.

758   **Natural Language and Character Set:**
759   The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
760   3.1.4.2. The "attributes-natural-language" MAY be the natural language of the Document object, rather than
761   the one requested.

762   **Group 2: Unsupported Attributes**

763   See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

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

769   **Group 3: Document Object Attributes**

770   This is the set of requested attributes and their current values. The Printer ignores (does not respond with)
771   any requested attribute or value which is not supported. Furthermore, the Printer MUST NOT return
772   Document Template attributes that were not supplied by a client in a Create-Document, Send-Document, or
773   Send-URI request or set by a Set-Document-Attributes request. So the response reflects what was
774   submitted. The Printer MAY omit returning attributes that are restricted by the Printer's security policy in
775   force, including whether the requesting user is the user that submitted the job (job originating user) or not
776   (see [RFC2911] section 8). However, the Printer MUST respond with the 'unknown' value for any supported
777   attribute (including all REQUIRED attributes) for which the Printer does not know the value, unless it would
778   violate the security policy. See the description of the "out-of-band" values in the beginning of [RFC2911]
779   Section 4.1.

780   **3.7   Get-Documents Operation**

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

784   This operation is similar to the Get-Document-Attributes operation (see section 3.5), except that this Get-Documents
785   operation returns attributes from all Document objects contained in the Job object, instead of from a single selected
786   Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return

787 attributes that were submitted by a client when the Document object was created by the Create-Document, Send-
788 Document, or Send-URI operations and possibly modified by the Set-Document-Attributes operation (see section
789 3.8).

3.7.1 Get-Documents Request

791 The client submits the Get-Documents request to a Printer object. The Get-Documents is similar to the Get-Jobs
792 operations (see [RFC2911] section 3.2.6) except that there are no equivalents to the "which-jobs" and "my-jobs"
793 operation attributes.

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

795 **Group 1: Operation Attributes**

796 **Natural Language and Character Set:**
797 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
798 3.1.4.1.

799 **Target:**
800 Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s)
801 which define the target Job object for this operation as described in [RFC2911] section 3.1.5.

802 **Requesting User Name:**
803 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
804 [RFC2911] section 8.3.

805 **3.7.1.1 "limit" (integer(1:MAX)):**

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

812 **3.7.1.2 "requested-attributes" (1setOf type2 keyword):**

813 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute. It is a set of
814 Document attribute names and/or attribute groups names in whose values the requester is interested. This
815 set of attributes is returned for each Document object that is returned. The allowed attribute group names
816 are the same as those defined in the Get-Document-Attributes operation in section 3.6.1.

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

819 'document-number' (see section 8.1)
820 'document-id-uri' (see section 8.2).
821

3.7.2 Get-Documents Response

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

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

828 **Group 1: Operation Attributes**

829   **Status Message:**
830   In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
831   "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
832   in [RFC2911] sections 13 and 3.1.6.

833   **Natural Language and Character Set:**
834   The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
835   3.1.4.2.

836 **Group 2: Unsupported Attributes**

837   See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

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

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

844   The Printer object responds with one set of Document Object Attributes for each returned Document object.
845   The Printer object ignores (does not respond with) any requested attribute or value which is not supported or
846   which is restricted by the security policy in force, including whether the requesting user is the user that
847   submitted the job (job originating user) or not (see [RFC2911] section 8). However, the Printer object MUST
848   respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which
849   the Printer object does not know the value, unless it would violate the security policy. See the description of
850   the "out-of-band" values in the beginning of [RFC2911] section 4.1.

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

853 ## 3.8 Set-Document-Attributes Operation

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

858 This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see
859 [set-ops] section 4.2). The only differences are that the Set-Document-Attributes operation is directed at a Document
860 object rather than a Job object. As with the Set-Job-Attributes operation, The Set-Document-Attributes operation
861 can add an attribute to the Target object, accepts the 'delete-attributes' out-of-band value to remove an attribute from
862 the Target object. In addition the validation is the same as the Create-Document, Send-Document, and Send-URI
863 operations that create Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer
864 Description attributes (see [RFC2911] section 3.1).

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

868   If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [set-ops] section 8.2),
869   then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic
870   effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as
871   if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
872   applies its default attribute or behavior with lower precedence that the PDL (see the beginning of [RFC2911] section
873   4.2 and [RFC2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-
874   Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
875   However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
876   subsequent Set-Document-Attributes operation.

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

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

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

897   **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 document has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

898

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

902 3.8.1 Settable and READ-ONLY Document Description attributes

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

906 Almost all Document Description attributes (see [RFC2911] section 4.3) MUST NOT be settable, i.e., they are
907 defined to be READ-ONLY. Only Document Description attributes marked with "(r/w) in Table 8 MAY be settable
908 using Set-Document-Attributes. The Printer MUST reject a Set-Document-Attributes request that attempts to set any
909 attributes in Table 8 that is not marked "(r/w).

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

913 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
914 owner (as determined in the Job Creation operation) or an operator or administrator of the Printer object (see
915 [RFC2911] Sections 1 and 8.5).

916 3.8.2 Set-Document-Attributes Request

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

918 **Group 1: Operation Attributes**

919   **Natural Language and Character Set:**
920   The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
921   3.1.4.1.

922   **Target:**
923   The client MUST supply the "document-number" (integer(1:MAX)) operation attribute immediately after either
924   (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which
925   define the target Document object for this operation as described in [RFC2911] section 3.1.5. If the client
926   omits the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-
927   error-bad-request' status code.

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

936   **Requesting User Name:**
937   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
938   [RFC2911] section 8.3.

939 **Group 2: Document Attributes**

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

948 In order to set the Document's "document-message" Document Description attribute (see section 8.10), the
949 client MUST supply the attribute in Group 2, rather than supplying a "document-message" operation attribute
950 in Group 1.

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

3.8.3 Set-Document-Attributes Response

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

955 **Group 1: Operation Attributes**

956 **Status Message:**
957 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
958 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
959 in [RFC2911] sections 13 and 3.1.6.

960 **Natural Language and Character Set:**
961 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
962 3.1.4.2.

963 **Group 2: Unsupported Attributes**

964 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

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

970   1. The number of attributes supplied by the client exceeds the maximum number that the Printer
971   supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see
972   [RFC2911] section 13.1.4.9).

973   2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band
974   attribute value (see [RFC2911] section 3.1.7 and [RFC2910]) and the 'client-error-attributes-or-
975   values-not-supported (see [RFC2911] section 13.1.4.12).

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

979   4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.
980   If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
981   supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [RFC2911]
982   section 13.1.4.12).

983   5. The values of some of the supplied attributes conflict with one another and/or other Document
984   attribute values not being set: if the conflicting attribute in the operation has a single value return
985   the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute
986   and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-
987   conflicting-attributes' status code (see [RFC2911] section 13.1.4.15).

988 3.9 Cancel-Document Operation

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

993 The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified
994 Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-
995 reasons" Document Description attribute to 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed
996 again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job
997 operation (see [RFC2911] section 3.3.7), any canceled Documents are also printed again. Thus Cancel-Document
998 has the same semantics as Cancel-Job (see [RFC2911] section 3.3.3), which only cancels the processing of the job,
999 and doesn't delete the Job object itself. See the Delete-Document operation (section 3.11) to remove the Document
1000 object itself immediately from the Job and Printer.

1001 The Cancel-Document operation does not affect the states of any of the other Document objects in the job. If the Job
1002 was processing and there are more Documents to be processed, the Printer does so. If there are no further
1003 Documents to process, the Job moves to the 'completed' state as usual whenever there is no more processing to be
1004 done.

1005 The Printer MUST accept or reject the request based on the document's current state and transition the document to
1006 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'

1007 Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document
1008 states, the Printer object MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
1009 attribute and then transition the document to the 'canceled' state when the processing ceases (see [RFC2911]
1010 section 4.3.8).

1011 Rule 2: If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons"
1012 attribute, then the Printer object MUST reject a Cancel-Document operation.

1013 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
1014 owner or an operator or administrator of the Printer object (see [RFC2911] sections 1 and 8.5). Otherwise, the
1015 Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-
1016 not-authorized' as appropriate.

3.9.1 Cancel-Document Request

1018 The following groups of attributes are part of the Cancel-Document Request:

1019 **Group 1: Operation Attributes**

1020 **Natural Language and Character Set:**
1021 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
1022 3.1.4.1.

1023 **Target:**
1024 The client MUST supply the "document-number" (integer(1:MAX)) operation attribute immediately after either
1025 (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which
1026 define the target Document object for this operation as described in section [RFC2911] 3.1.5. If the client
1027 omits the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-
1028 error-bad-request' status code.

1029 **Requesting User Name:**
1030 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
1031 [RFC2911] section 8.3.

1032 **3.9.1.1 document-message (text(127))**   **operation attribute**

1033 The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
1034 support the corresponding "document-message" (text(127)) Document Description attribute (see section
1035 8.10) and copy this value to the "document-message" Document Description attribute. The end user can use
1036 this Document Description attribute as a message to the operator and the operator can use it as a message
1037 to the user. The Printer MAY print this message on a document start sheet for this document, if any.

1038 The Printer MUST ignore the new "job-message-from-operator" operation attribute (see [adm-ops] section 6)
1039 for this operation, since that is a job only attribute and Cancel-Document is a Document operation.

3.9.2 Cancel-Document Response

1041 The following sets of attributes are part of the Cancel-Document Response:

1042 **Group 1: Operation Attributes**

1043 **Status Message:**
1044 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
1045 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
1046 in [RFC2911] sections 13 and 3.1.6.

1047 **Natural Language and Character Set:**
1048 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
1049 3.1.4.2.

1050 **Group 2: Unsupported Attributes**

1051   See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

1052 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
1053 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document
1054 enters the 'canceled' document-state (see section 8.5), the "document-state-reasons" attribute (see section 8.7)
1055 SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the Document
1056 might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

1057 3.10 Cancel-Current-Document Operation[6]

1058 This OPTIONAL operation allows a client to cancel either (1) any current Document of the current Job on the target
1059 Printer or (2) the specified document in a specified job if they are the current document and job on the Printer. One
1060 of the uses of this operation is by operators in an emergency, where the job-id and document-number might be
1061 unknown to the operator. See section 3.9 for the semantics of canceling a Document and what values the Printer
1062 sets the Document's Document Description attributes. Since a Document might already be marking by the time a
1063 Cancel-Current-Document is received, some media sheet pages might be printed before the document is actually
1064 terminated.

1065 If the client does not supply a "job-id" and "document-number" operation attributes, the Printer MUST accept the
1066 request and cancel the current document if there is a current document in the 'processing' state; otherwise, it MUST
1067 reject the request and return the 'client-error-not-possible' status code. If more than one document is in the
1068 'processing' or 'processing-stopped' states, the one that is marking is canceled and the others are unaffected.

1069 Warning: On a shared printer, there is a race condition. Between the time that a user issues this operation and its
1070 acceptance, the current document might change to a different document or even a different job. If the user or
1071 operator is authenticated to cancel the new job, the wrong document is canceled. To prevent this race from
1072 canceling the wrong document, the client MAY supply the "job-id" and "document-number" operation attributes which
1073 is checked against the current job's "job-id" and the current Document's "document-number". If the job identified by
1074 the "job-id" attribute is not the current job on the Printer and the "document-number" is not the current Document in
1075 that current Job, i.e., is not in the 'processing' state, the Printer MUST reject this operation and return the 'client-
1076 error-not-possible' status code. Otherwise, the Printer cancels the specified document.

1077 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
1078 owner (as determined in the Job Creation operation) or an operator or administrator of the Printer object (see
1079 [RFC2911] Sections 1 and 8.5).

1080 The Cancel-Current-Document Request and Cancel-Current-Document Response have the same attribute groups
1081 and attributes as the Pause-Printer operation (see [RFC2911] section 3.2.8) with the addition of the following Group
1082 1 Operation attributes in the request:

1083 3.10.1 job-id (integer(1:MAX))   operation attribute

1084   The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job is still the
1085   current job on the target Printer object. The Printer MUST supports this operation attribute, if it supports this
1086   operation.

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[6] In some modeling regimes, the Cancel-Current-Document operation might be a Device method, rather than a Job
or Document method.

1087   **3.10.2 document-number (integer(1:MAX))**   **operation attribute**

1088   The client OPTIONALLY supplies this Operation attribute in order to verify that the identified document is still
1089   the current document on the target Printer object. The Printer MUST supports this operation attribute, if it
1090   supports this operation.

1091   **3.10.3 document-message (text(127))**   **operation attribute**

1092   The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
1093   support the corresponding "document-message" (text(127)) Document Description attribute (see section
1094   8.10) and copy this value to the "document-message" Document Description attribute. The end user can use
1095   this Document Description attribute as a message to the operator and the operator can use it as a message
1096   to the user. The Printer MAY print this message on a document start sheet for this document, if any.

1097   The Printer MUST ignore the new "job-message-from-operator" operation attribute (see [adm-ops] section 6) for this
1098   operation, since that is a job only attribute and Cancel-Current-Document is a Document operation.

1099   3.11 Delete-Document Operation

1100   This OPTIONAL operation removes the specified Document object and its data immediately from the specified Job.
1101   The Printer MUST reject the request if the Document is in any state, but 'pending" (there is no 'pending-held' state for
1102   Documents). The Printer does not reassign the "document-number" Document Description attribute values of the
1103   remaining Document objects in the Job, so that the deleted Document object leaves a gap in the document
1104   numbering space for the Job. The Printer MUST return a 'client-error-not-found' status code, in a subsequent Get-
1105   Document-Attributes operation for this Document object specifying its former "document-number". This operation is
1106   similar to the Purge-Jobs operation which immediately deletes all jobs from the Printer. However, the Delete-
1107   Document operation only deletes a single Document from the specified Job.

1108   *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation MUST be an operator
1109   or administrator of the Printer object (see [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the
1110   operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
1111   appropriate. This operation requires operator/administrator privileges, otherwise a rogue client could submit, then
1112   delete, at will using up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-
1113   Document which goes through the normal accounting, if any.

1114   The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
1115   Cancel-Document operation (see section 3.9).

1116   4   Semantic extensions to Job operations

1117   This section defines effects that Job operations have on the Document object. Printer and Subscription object (Event
1118   Notification [ntfy]) operations MUST have no effect on the Document object and the Document object has no effect
1119   on the semantics of the Printer and Subscription operations. The Job operations that MUST NOT have any effect on
1120   the Document object because they are defined to affect the Job object as a whole are: **Get-Job-Attributes**[7]
1121   ([RFC2911] section 3.3.4)**, Get-Jobs**[8] ([RFC2911] section 3.2.6)**, Hold-Job** ([RFC2911] section 3.3.5)**, Promote-Job**

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[7] 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.
[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.

1122 ([adm-ops] section 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2)**, Resume-Job** ([adm-ops] section
1123 4.3.2)**, Schedule-Job-After** ([adm-ops] section 4.4.2)**, Set-Job-Attributes** ([set-ops] section 4.2), and **Validate-Job**
1124 ([RFC2911] section 3.2.3).

1125 The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations
1126 are, in alphabetical order:

1127 4.1 Cancel-Current-Job ([adm-ops] section 4.2)

1128 The Printer sets the "document-state" Document Description attribute to 'canceled' and the "document-state-reasons"
1129 Document Description attribute to 'canceled-by-xxx' for any documents in the current Job that have not yet reached a
1130 terminal state ('completed', 'canceled', or 'aborted'), where "xxx" is 'user' or 'operator'. See [adm-ops] section 4.2.

1131 4.2 Cancel-Job ([RFC2911] section 3.3.3)

1132 The Printer sets "document-state" Document Description attribute to 'canceled' and the "document-state-reasons"
1133 Document Description attribute to 'canceled-by-user' or 'canceled-by-operator' for *all* Document objects in the
1134 identified Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted').

1135 4.3 Create-Job ([RFC2911] section 3.2.4)

1136 The Printer creates the Job object with all of the mixture of Job and Document attributes supplied in the Create-Job
1137 operation. The Document objects that are subsequently created for the specified Job inherit the Document attributes
1138 from the Job object. However, the Printer MUST NOT copy down any Job Level attributes, including "document-
1139 overrides" ([override]) to the Document object as observable by a client in any Get-Documents or Get-Document-
1140 Attributes operation responses.

1141 4.4 Print-Job ([RFC2911] section 3.2.1)

1142 The Printer creates one Document object as a side effect of the Print-Job operation. All of the attributes supplied by
1143 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on
1144 the Document object because the Document object inherits them from the Job object. The Printer MUST populate
1145 the single Document object's "document-state", "document-state-reasons", and "document-number" Document
1146 Description attributes with appropriate values. Thus a Get-Documents or Get-Document-Attributes for a Job created
1147 by Print-Job will return no attributes supplied by the client, but will return the populated Document Description
1148 attributes.

1149 4.5 Print-URI ([RFC2911] section 3.2.2)

1150 The Printer creates one Document object as a side effect of the Print-URI operation. All of the attributes supplied by
1151 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on
1152 the Document object because the Document object inherits them from the Job object. The Printer MUST populate
1153 the Document object's "document-state", "document-state-reasons", and "document-number" Document Description
1154 attributes with appropriate values. Thus a Get-Documents or Get-Document-Attributes for a Job created by Print-Job
1155 will return no attributes supplied by the client, but will return the populated Document Description attributes.

1156 4.6 Purge-Jobs ([RFC2911] section 3.2.9)

1157 The Printer removes all Job and all of their contained Document objects.

4.7 Release-Job ([RFC2911] section 3.3.6)

The Printer moves the job to the 'pending' state, if there are no other "job-state-reasons" to hold the job. The values of the "document-state-reasons" attributes MUST NOT affect job scheduling (see Table 11), only the Job's "job-state-reasons" values.

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

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

4.9 Restart-Job ([RFC2911] section 3.3.7)

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

4.10 Send-Document ([RFC2911] section 3.3.1)

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

4.11 Send-URI ([RFC2911] section 3.3.2)

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

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

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

5 Attribute Precedence

This section defines the Attribute Precedence rules for Queue Override attributes, Page Override attributes, Document Object attributes, Document Override attributes, Job Object attributes, PDL instructions, PDL Interpreter initialization files, and Printer object defaults. Since each attribute can be specified for all of these levels, it is important to define which level takes precedence when the same attribute occurs at different levels with differing values.

The attribute precedence model has the following features:

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

1189 2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1190   driver, submission client, protocol, and Printer:

1191 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,
1192   operator, Printer object, and the output device hardware.

1193 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
1194   pending, job processing.

1195 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
1196   driver, submission client, protocol, and Printer.

1197 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is
1198   to the affected object, the higher the precedence is assigned to that attribute, since precedence is intended
1199   to reflect the user's wishes.

1200 The following levels of Attribute Precedence are defined in order of decreasing priority:

1201 1. **queue override** - The value that the Printer enforces for any job submitted to it (see [prod-print2] section
1202   3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
1203   to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =
1204   'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
1205   long edge.

1206 Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for
1207   its "pdl-override-supported" attribute (see [prod-print2] section 8). All other levels are available for all
1208   Printers independent of the "pdl-override-supported" value.

1209 **2. Document Level - page override programming** - The special "page-overrides" collection Document
1210   Template attribute (see [override]) supplied at the Document Level, that is, in a Create-Document, Send-
1211   Document, or Send-URI operation, that contains the attributes that are to have the page override status
1212   for the specified ranges of pages in the Input-Document or the Output-Document. Supplied by the client
1213   when submitting a Document object, or set by the user or operator after the Document has been
1214   accepted either using the Set-Document-Attributes operation, or by the operator using means local to the
1215   Printer. Example: "page-overrides" = {"page-number" = '1'; "media" = 'letterhead'}

1216 3. **Job Level - page override programming** - The special "page-overrides" collection Job Template
1217   attribute (see [override]) supplied at the Job Level, that is, in a Job Creation operation, that contains the
1218   attributes that are to have the page override status for the specified ranges of pages in the Input-
1219   Document or the Output-Document. Supplied by the client when submitting a job either in the protocol,
1220   or set by the user or operator after the job has been accepted either using the Set-Job-Attributes
1221   operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"page-
1222   number" = '1'; "media" = 'letterhead'}

1223 **4. Document Level - Document object attributes -** The Document attributes supplied at the Document
1224   Level, that is, in a Create-Document, Send-Document, or Send-URI operation to apply to the Input
1225   Document. Supplied by the client when submitting a Document object, or set by the user or operator
1226   after the Document has been accepted either using the Set-Job-Attributes operation, or by the operator
1227   using means local to the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1228 5. **Document Level - document override programming -** The special "document-overrides" collection
1229   operation attribute (see [override]) supplied by the client in the Send-Document or Send-URI request.
1230   The collection contains the member attributes that are to override attributes specified at lower
1231   precedence for the specified range of documents, including the current Document and subsequently

1232   created Documents. Clients that support the Document object SHOULD supply the attributes as
1233   Document Template attributes directly when creating the Document, instead of using the operation
1234   attribute mechanism. Example: "document-overrides" = {"input-documents" = '5:5'; "media" =
1235   'transparency'}

6. **Job Level - document override programming** - The special "document-overrides" collection Job
1236
1237   Template attribute (see [override]) that contains the attributes that are to have the document override
1238   status for the specified Input-Documents or Output-Documents. Supplied by the client when submitting a
1239   job either in the protocol, or set by the user or operator after the job has been accepted either using the
1240   Set-Job-Attributes operation, or by the operator using means local to the Printer. Example: "document-
1241   overrides" = {"input-documents" = '5:5'; "media" = 'transparency'}

7. **Job Level - Job object and Document object attributes** - The Job attributes and Document attributes
1242
1243   supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation. Supplied by the
1244   client when submitting a Job in the protocol, or set by the user or operator after the job has been
1245   accepted either using the Set-Job-Attributes operation, or by the operator using means local to the
1246   Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

8. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print
1247
1248   driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether
1249   PDL document data is actually lower precedence than the preceding levels depends on the
1250   implementation as expressed in the "pdl-override-supported" Printer Description attribute (see
1251   [RFC2911] section 4.4.28 and [prod-print2] section 8.1).
1252
1253   Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
1254   requested" (see [RFC2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a
1255   corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
1256   attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
1257   requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
1258   and PCL NEED NOT have orientation, in which case, "orientation-requested" takes affect.

9. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
1259
1260   each document in a Job. See description of "pdl-init-file" Job Template attribute in [prod-print2] Section
1261   5.8. It is immaterial how this file is specified, whether it be by a queue override, job object attribute or
1262   printer default – the precedence of the contents of this file is at this level.

10. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
1263
1264   higher levels have supplied a value. The Printer implementation MUST supply values for all of the
1265   Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,
1266   if the output device will use media from the large-capacity input tray if not directed otherwise, the
1267   implementation MUST supply the Printer's "media-default" attribute with the 'large-capacity' keyword
1268   value without requiring the administrator to configure that value. The implementation MUST allow the
1269   administrator to configure the Printer's "xxx-default" attributes to other values, if other value are
1270   supported by the implementation. Example: The administrator changes the Printer's "media-default"
1271   from 'large-capacity' to 'na-letter'.

1272   Note: Because of the requirement that the implementation supply pre-configured values for the
1273   Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence
1274   level.

1275 # 6 Operation Attributes for the Job and Document Creation operations

1276 This section lists *all* the Operation attributes that have been defined in other IPP specifications that are used in Job
1277 Creation operations and extends their use to the Document Creation operations defined in the IPP specification.
1278 Operation attributes relate to the operation and do not depend on the printing capabilities of the Printer.

1279 ## 6.1 Operation Attributes supplied at the Job and Document Levels for Creation

1280 Table 6 lists the Operation attributes that clients supply at the Job Level and/or the Document Level. The value of
1281 the "ipp-attribute-fidelity" operation attribute (see section 6.2.1) does *not* affect the Printer's handling of the other
1282 operation attributes, only its handling of the Job Template and Document Template attributes (see section 7).

1283 The "Level Supplied" column indicates whether the Operation attribute can be supplied at the Job Level (Print-Job,
1284 Print-URI, and Create-Job) and at the Document Level (Create-Document, Send-Document, and Send-URI) . The
1285 Conformance column indicates the conformance requirements for what the client supplies in a request and the
1286 Printer supports in a request. The Reference and Section columns list the IETF or IEEE-ISTO specification which
1287 defines the semantics of the attribute.

1288 Legend:
1289 [job-]   indicates an attribute that shouldn't have had a "job-" prefix in its name in [RFC2911], so that the same
1290   attribute name could also be used for the Document object as a Document Description attribute. Note: For
1291   the PWG Semantic Model, the "job-" prefix is dropped.
1292 "-"   indicates that the Job or Document attribute is *not* defined.
1293 *   these operation attributes are defined for *all* operations, not just Job Creation and Document Creation
1294   operations
1295 **   the Printer MUST copy these operation attributes to the corresponding Job Description or Document
1296   Description attributes.   See Table 9 for the corresponding Job and Document Description attributes.

1297 **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[9]	y	MAY	MUST	[RFC2911] §3.2.1.1
**document-format ** **	mimeMediaType	y[10]	y	MAY	MUST	[RFC2911] §3.2.1.1
**document-mandatory-attributes ** **	1setOf type2 keyword	-	y	MAY	MAY	[this spec] §6.2.3
**document-message * ** **	text(127)	-	y	MAY	MAY	[this spec] §8.10
**document-name ** **	name(MAX)	y[11]	y	MAY	MUST	[RFC2911] §3.2.1.1

[9] The "compression", "document-format", "document-name", and "document-natural-language" MAY be supplied in the Create-Job Job Creation operation as an extension to [RFC2911] as specified in [override]. If supplied in any Job Creation operation, the Printer copies them to corresponding Job Description attributes for subsequent Job query. These supplied attributes become defaults for the Documents in the job and used if the client does not supply the corresponding operation attribute in the Send-Document or Send-URI Document Creation operation. ISSUE 04: With the Document object, do we want to also defines Job Description attributes for: "compression", "document-format", "document-name", "document-natural-language", since they are really Document attributes?

[10] See long footnote for the "compression" operation attribute in this table.
[11] See long footnote for the "compression" operation attribute in this table.

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
document-natural-language **	naturalLanguage	y[12]	y	MAY	MAY	[RFC2911] §3.2.1.1
document-overrides[13]	1setOf collection	-	y	MAY	MAY	[override] §5.1, §9.2.2
See "document-overrides" in Table 8 for the list of member attributes						
document-uri **	uri	y	y	MAY[14]	MAY	[RFC2911] §3.2.2
input-document-number[15]	integer(1:MAX)	-	y	MAY	MAY	[override] §9.2, [this spec] §3.1.1.1
ipp-attribute-fidelity **	boolean	y	y	MAY	MUST	[RFC2911] §3.2.1.1, [this spec] §6.2.1
[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	[this spec] §6.2.2
[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
job-password **	octetString(255)	y	-	MAY	MAY	[prod-print2] §4.1
job-password-encryption **	type3 keyword | name(MAX)	y	-	MAY	MAY	[prod-print2] §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[16]	1setOf collection	-	y	MAY	MAY	[override] §5.2, §9.2.3
See "page-overrides" in Table 8 for the list of member attributes						
printer-uri[17] *****	uri	y	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

---

[12] See long footnote for the "compression" operation attribute in this table.

[13] According to [override] section 9.2.2, the "document-overrides" (collection) attribute MAY be supplied by the client in a Send-Document or Send-URI request as an Operation attribute to apply document overrides to this and/or subsequent documents in the job. The Printer MUST merge this operation attribute into the "document-overrides" Document Template attribute, if any. See the "page-overrides" Job Template attribute in Table 8 for the listing of the member attributes. However, with the introduction of the Document object, the "document-overrides" (collection) attribute SHOULD NOT be used (either as a Job Template attribute or an Operation attribute). Instead, the client simply supplies the Document Template attributes (see Table 8) for each Document Creation request (in a new Document Template attribute group) without needing a collection.

[14] The "document-uri" operation attribute MUST be supplied in the Print-URI Job Creation operation and the Send-URI Document Creation operation, MAY be supplied in a Validate-Document operation, and MUST NOT be supplied in other operations.

[15] The "input-document-number" operation attribute sets the Document's "document-number" Document Description attribute (see section 8.1).

[16] According to [override] section 9.2.3, the "page-overrides" (collection) attribute MAY be supplied by the client in a Send-Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent documents in the job. The Printer MUST merge this operation attribute into the "page-overrides" Document Template attribute, if any. See the "page-overrides" Job Template attribute in Table 8 for the listing of the member attributes. However, with the introduction of the Document object, the "page-overrides" (collection) attribute SHOULD be more simply supplied as one of the Document Template attributes for this document only.

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

Operation attribute name for Job and Document Creation *requests*	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
version-number *	X.Y	y	y	MUST	MUST	[RFC2911] §3.1.8

1298 * and **. See Legend at the beginning of the Table.

1299 6.2 Operation Attributes defined for use in Document Creation operations

1300 This section defines extensions to existing Operation attributes in Job and Document Creation operations and new
1301 Operation attributes for use in Document Creation operations.

1302 6.2.1 ipp-attribute-fidelity (boolean) (RFC2911] sections 3.2.1 and 15)

1303 This operation attribute indicates whether or not the Printer MUST honor all supplied Job Template and Document
1304 Template attributes in the Job Creation and Document Creation operation, respectively. The client MAY supply this
1305 attribute in Job Creation and Document Creation operations. The Printer MUST support this attribute in Job Creation
1306 and Document Creation operations. The value 'true' indicates that total fidelity to client supplied Job Template and
1307 Document Template attributes and values is required, else the Printer MUST reject the request. The value 'false'
1308 indicates that a reasonable attempt to print the Job or Document object is acceptable and the Printer object MUST
1309 accept the request. If not supplied, the Printer assumes the value is 'false'. All Printer implementations MUST
1310 support both types of job processing. See [RFC2911] section 15 for a full description of "ipp-attribute-fidelity" and its
1311 relationship to other attributes, especially the Printer object's "pdl-override-supported" attribute.

1312 6.2.2 job-mandatory-attributes (1setOf type2 keyword)

1313 This operation attribute identifies which Job Template attributes the Printer MUST honor, in a Job Creation operation,
1314 otherwise, the Printer MUST reject the operation. The client MAY supply this attribute in Job Creation operations.
1315 The Printer MUST support this attribute in Job Creation operations. The Printer MUST ignore this attribute if the
1316 client supplies the "ipp-attribute-fidelity" operation attribute (see section 6.2.1) with a 'true' value, since a 'true' value
1317 indicates that the Printer MUST honor all supplied Job Template and Document Template attributes.

1318 The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template
1319 attributes, for example, 'job-hold-until', 'job-finishings' (see section 7.1.4), 'copies' and 'media'. In order to identify a
1320 member attribute of a collection attribute, the keyword names of both the collection attribute and the member
1321 attribute are given separated by a period (.) character. For example, to make the "media" attribute of the "cover-
1322 front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

1323 6.2.3 document-mandatory-attributes (1setOf type2 keyword)

1324 This operation attribute identifies which Document Template attributes the Printer MUST honor in a Document
1325 Creation operation, otherwise, the Printer MUST reject the operation. The client MAY supply this attribute in
1326 Document Creation operations. The Printer MUST support this attribute in Document Creation operations. The
1327 Printer MUST ignore this attribute if the client supplies the "ipp-attribute-fidelity" operation attribute (see section 6.2.1)
1328 with a 'true' value, since a 'true' value indicates that the Printer MUST honor all supplied Job Template attributes and
1329 Document Template attributes.

1330 The values of the "document-mandatory-attributes" attribute are the keyword attribute names that identify Document
1331 Template attributes, for example, 'copies' and 'media'. In order to identify a member attribute of a collection attribute,
1332 the keyword names of both the collection attribute and the member attribute are given separated by a period (.)
1333 character. For example, to make the "media" attribute of the "cover-front" collection attribute mandatory, supply the
1334 keyword value: 'cover-front.media'.

1335   ## 6.3   Operation Attributes returned in Job and Document Creation responses

1336   Table 7 lists the Operation attributes that Printers return in Job Creation operation *responses*: Print-Job, Print-URI,
1337   and Create-Job and in Document Creation operation *responses*: Send-Document and Send-URI. The column
1338   labeled "Conformance" indicates the conformance for what the Printer returns and what the Printer supports. The
1339   Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1340   **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	[this spec] §8.2
document-number	integer(1:MAX)	MUST	MUST	[this spec] §8.1
job-id	integer(1:MAX)	MUST	MUST	[RFC2911] §4.3.2
job-uri	uri	MUST	MUST	[RFC2911] §4.3.1
redirect-uri (uri)18	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

1341   * - indicates attributes that are defined for *all* operations, not just Job Creation operations
1342

1343   # 7   Job Template and Document Template attributes

1344   Table 8 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding
1345   Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the
1346   Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1347   A subset of these Job Template attributes (e.g., "document-format" and "media", but not "job-priority") are also
1348   defined to apply to Documents and are called Document Template attributes when supplied at the Document Level.
1349   Document Template attribute can be supplied in the Create-Document, Send-Document, and Send-URI operations.

---

[18] 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.

1350 These Document Template attributes can also be supplied as Document Overrides using the "document-overrides"
1351 Job Template attribute (see [overrides]).

1352 A subset of the Document Template attributes that apply to pages (e.g., "media", but not "document-format" or "job-
1353 priority") can also be supplied as Page Overrides using the "page-overrides" Job Template collection attribute (see
1354 [override]) or as a Document Template attribute.

1355 According to [override], the "document-overrides" (collection) attribute MAY be supplied by the client in a Send-
1356 Document or Send-URI request as an Operation attribute to apply document overrides to this and/or subsequent
1357 documents in the job. See the "document-overrides" Job Template attribute in Table 8 for the listing of the member
1358 attributes. However, with the introduction of the Document object, the "document-overrides" (collection) attribute
1359 SHOULD NOT be used (either as a Job Template attribute or an Operation attribute). Instead, the client simply
1360 supplies the Document Template attributes (see Table 8) for each Document Creation request (in a new Document
1361 Template attribute group) without needing a collection.   A Printer MAY support "document-overrides" as specified in
1362 [override] for backward compatibility with clients that don't support the Document object.

1363 The "document-overrides" attribute is also useful in combination with the "pages-per-subset" attribute (see
1364 [overrides]) which divides up the Input Page stream concatenated across the Input Documents into separate Output
1365 Documents. For example, making every 10 Input Pages be a separate Output Document but the client only wants to
1366 staple the first Output Document.

1367 Similarly, according to [override], the "page-overrides" (collection) attribute MAY be supplied by the client in a Send-
1368 Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent
1369 documents in the job. See the "page-overrides" Job Template attribute in Table 8 for the listing of the member
1370 attributes. However, with the introduction of the Document object, the "page-overrides" (collection) attribute
1371 SHOULD be more simply supplied as one of the Document Template attributes for the document being created only.
1372 However, a Printer MAY also support the "page-overrides" attribute as an operation attribute for backward
1373 compatibility with clients that do not support the Document object.

1374 The "Defined for use" column indicates whether the client MAY supply and the Printer support the attribute at the
1375 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.

1376
1377 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
1378 a Job Creation or Document Creation request or a Document Overrides or Page Overrides. If a Printer supports a
1379 Job Template or Document Template attribute, then it MUST copy the supplied attribute to the Job or Document
1380 object, respectively so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-
1381 Document-Attributes/Get-Documents operations, respectively. The effect of Job Template Attributes supplied in Job
1382 Creation requests are inherited by the Document objects, unless the Document Creation operation supplies the
1383 attribute with a different value.

1384 If a Job Template collection attribute is supported (see [coll]), then there are conformance requirements for which
1385 member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
1386 Conformance column for each collection member attribute in Table 8.

1387 **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[19]	y	n	MAY	MAY	[RFC2911] §4.2.5
cover-back	collection	y	y	n	MAY	MAY	[prod-print] §3.1
cover-type	type2 keyword				MUST	MUST	[prod-print] §3.1.2
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.1.1
media-col	collection					MAY	[prod-print] §3.1.1
cover-front	collection	y	y	n	MAY	MAY	[prod-print] §3.1
cover-type	type2 keyword				MUST	MUST	[prod-print] §3.1.2
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.1.1
media-col	collection					MAY	[prod-print] §3.1.1
document-overrides	collection	y	y[20]	n	MAY	MAY	[override] §5.1
input-documents[21]	1setOf rangeOfInteger(MAX)				MUST be one or the other, but NOT both	MUST	[override] §5.1.1
output-documents	1setOf rangeOfInteger(MAX)					MUST	[override] §5.1.2
document-copies	1setOf rangeOfInteger(MAX)				MAY	MAY	[override] §5.1.3
document-format	mimeMediaType				MAY	MUST	[override] §5.1.4
document-name	name (MAX)				MAY	MUST	[override] §5.1.5
compression	type3 keyword				MAY	MUST	[override] §5.1.6
document-natural-language	naturalLanguage				MAY	MAY	[override] §5.1.7
page-ranges	1setOf rangeOfInteger (1:MAX)				MAY	MAY	[override] §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	[prod-print2] §5.1

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[19] The IPP "copies" attribute is an *extensive* attribute, so its effect when supplied at the job level is not always inherited by the documents in a multi-document job. Instead, its effect depends on the value of the "multiple-document-handling" Job Template attribute. The 'single-document' and 'single-document-new-sheet' values produce copies of the job as a whole with the multiple input documents concatenated into a single output document for each job copy. The 'separate-document-uncollated-copies' value produce N copies of the first input document followed by N copies of the second input document, etc. The 'separate-document-collated-copies' produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc.
[20] The client can supply the "document-overrides" operation attribute in the Send-Document or Send-URI operations (see [override]).
[21] The Printer MUST support "document-format", "document-name", "compression", "document-natural-language", and "page-ranges" with the "input-documents" member attribute, but not 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[22]	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "finishing-col" is supported	[RFC2911] §4.2.6 [finish] §2
finishings-col	collection	y[9]	y	y		MAY	[prod-print] §3.2
finishing-template	name(MAX)				MAY	MAY	[prod-print] §3.2.1
stitching	collection				MAY	MAY	[prod-print] §3.2.2
stitching-reference-edge	type2 keyword				MUST	MUST	[prod-print] §3.2.2.1
stitching-offset	integer (0:MAX)				MUST	MUST	[prod-print] §3.2.2.2
stitching-locations	1setOf integer(0:MAX)				MUST	MUST	[prod-print] §3.2.2.3
font-name-requested	name(MAX)	y	y	y	MAY	MAY	[prod-print2] §5.2
font-size-requested	integer (1:MAX)	y	y	y	MAY	MAY	[prod-print2] §5.3
force-front-side	1setOf integer(1:MAX)	y[23]	y	y	MAY	MAY	[prod-print] §3.3
imposition-template	type2 keyword	name(MAX)	y	y	y	MAY	MAY	[prod-print] §3.4
insert-sheet	1setOf collection	y[10]	y	y	MAY	MAY	[prod-print] §3.5
insert-after-page-number	integer(0:MAX)				MUST	MUST	[prod-print] §3.5.1
insert-count	integer(0:MAX)				MAY	MUST	[prod-print] §3.5.2
media	type3 keyword	name(MAX)				MUST be one or the other, but NOT both	MUST	[prod-print] §3.5.3
media-col	collection					MAY	[prod-print] §3.5.3
job-account-id	name(MAX)	y	n	n	MAY	MAY	[prod-print] §3.6
job-accounting-sheets	collection	y	n	n	MAY	MAY	[prod-print] §3.8
job-accounting-sheets-type	type3 keyword	name(MAX)				MUST	MUST	[prod-print] §3.8.1
media	type3 keyword	name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.8.2
media-col	collection					MAY	[prod-print] §3.8.2
job-accounting-output-bin	type3 keyword	name(MAX)				MAY	MAY	[prod-print] §3.8.3
job-accounting-user-id	name(MAX)	y	n	n	MAY	MAY	[prod-print] §3.7
job-copies	integer(1:MAX)	y	n[24]	n	MAY	MAY	[this spec] §7.1.1

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[22] 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.

[23] 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.

[24] The "job-copies" Job Template attribute MUST NOT be supplied at the Document or Page Level. The "job-copies" Job Template attribute was introduced for use in clients or Printers that don't support "multiple-document-handling" = 'single-document' or '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[25]	n	MAY	MAY	[this spec] §7.1.2
same as **cover-back**	**see cover-back**						
job-cover-front	collection	y	n[26]	n	MAY	MAY	[this spec] §7.1.3
same as **cover-front**	**see cover-front**						
job-error-sheet	collection	y	n	n	MAY	MAY	[prod-print] §3.9
job-error-sheet-type	type3 keyword | name(MAX)				MUST	MUST	[prod-print] §3.9.1
job-error-sheet-when	type2 keyword				MAY	MAY	[prod-print] §3.9.2
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.9.3
media-col	collection					MAY	[prod-print] §3.9.3
job-finishings	1setOf type2 enum	y	n[27]	n	MAY	MAY	[this spec] §7.1.4
job-finishings-col	collection	y	n[28]	n	MAY	MAY	[this spec] §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	[prod-print2] §5.4
job-message-to-operator	text(MAX)	y	n[29]	n	MAY	MAY	[prod-print] §3.10
job-phone-number	text(127)	y	n	n	MAY	MAY	[prod-print2] §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	[prod-print2] §5.6
job-save-disposition	collection	y	n	n	MAY	MAY	[prod-print2] §5.7
save-disposition	type3 keyword	y	n	n	MAY	MAY	[prod-print2] §5.7.1.1
save-info	1setOf collection	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2
save-location	uri	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2.3.1
save-name	name(MAX)	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2.3.2
save-document-format	mimeMediaType	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2.3.3
job-sheet-message	text(MAX)	y	n	n	MAY	MAY	[prod-print] §3.12

[25] The "job-cover-back" Job Template attribute MUST NOT be supplied at the Document or Page Level. The "job-cover-back" Job Template attribute was introduced for use in clients or Printers that don't support "multiple-document-handling" = 'single-document' or 'single-document-new-sheet'.
[26] The "job-cover-front" Job Template attribute MUST NOT be supplied at the Document or Page Level. The "job-cover-front" Job Template attribute was introduced for use with clients or Printers that don't support "multiple-document-handling" = 'single-document' or 'single-document-new-sheet'.
[27] The "job-finishing" Job Template attribute MUST NOT be supplied at the Document or Page Level. The "job-finishings" Job Template attribute was introduced for use with clients or Printers that don't support "multiple-document-handling" = 'single-document' or 'single-document-new-sheet'.
[28] The "job-finishing-col" Job Template attribute MUST NOT be supplied at the Document or Page Level. The "job-finishings-col" Job Template attribute was introduced for use with clients or Printers that don't support "multiple-document-handling" = 'single-document' or 'single-document-new-sheet'.
[29] 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	[prod-print] §3.11
job-sheets	type3 keyword | name(MAX)				MUST	MUST	[prod-print] §3.11.1
media	type3 keyword | name(MAX)				MUST be one or the other, but NOT both	MUST	[prod-print] §3.11.2
media-col	collection					MAY	[prod-print] §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	[prod-print] §3.13
media-back-coating	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.10
media-color	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.4
media-front-coating	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.10
media-grain	type3 keyword | name(MAX)				MAY	MAY	[prod-print2] §8.4.2
media-hole-count	integer(0:MAX)				MAY	MAY	[prod-print] §3.13.6
media-info	text(255)				MAY	MAY	[prod-print] §3.13.3
media-key	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.1
media-material	type3 keyword | name(MAX)				MAY	MAY	[prod-print2] §8.4.3
media-order-count	integer(1:MAX)				MAY	MAY	[prod-print] §3.13.7
media-preprinted	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.5
media-recycled	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.11
media-size	collection				MAY	MUST	[prod-print] §3.13.8
x-dimension	integer(0:MAX)				MUST	MUST	[prod-print] §3.13.8.1
y-dimension	integer(0:MAX)				MUST	MUST	[prod-print] §3.13.8.2
media-tooth	type3 keyword | name(MAX)				MAY	MAY	[prod-print2] §8.4.1
media-thickness	integer(1:MAX				MAY	MAY	[prod-print2] §8.4.4
media-type	type3 keyword | name(MAX)				MAY	MAY	[prod-print] §3.13.2
media-weight-metric	integer(0:MAX)				MAY	MAY	[prod-print] §3.13.9
media-input-tray-check	type3 keyword | name(MAX)	y	y	y	MAY	MAY	[prod-print] §3.14
multiple-document-handling	type2 keyword	y	n	n	MAY	MUST if multiple document jobs supported	[RFC2911] §4.2.4

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
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	[output-bin] §2.1
page-delivery	type2 keyword	y	y	n	MAY	MAY	[prod-print] §3.15
page-order-received	type2 keyword	y	y	n	MAY	MAY	[prod-print] §3.16
page-overrides	1setOf collection	y[30]	y	n	MAY	MAY	[override] §5.2
input-documents	1setOf rangeOfInteger(MAX)				MUST be one or the other, but NOT both	MUST	[override] §5.2.1
output-documents	1setOf rangeOfInteger(MAX)					MUST	[override] §5.2.2
document-copies	1setOf rangeOfInteger(MAX)				MAY	MAY	[override] §5.2.3
pages	1setOf rangeOfInteger(MAX)				MUST	MUST	[override] §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[31]	y	n	MAY	MAY	[RFC2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	y[32]	n	n	MAY	MAY	[prod-print] §5.3
pdl-init-file	1setOf collection	y	y	n	MAY	MAY	[prod-print2] §5.8
pdl-init-file-location	uri				MAY	MAY	[prod-print2] §5.8.1.1
pdl-init-file-name	name(MAX)				MAY	MAY	[prod-print2] §5.8.1.2
pdl-init-file-entry	name(MAX)				MAY	MAY	[prod-print2] §5.8.1.3
presentation-direction-number-up	type2 keyword	y	y	y	MAY	MAY	[prod-print] §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	[prod-print2] §5.9
proof-print-copies	integer (0:MAX)	y	n	n	MAY	MAY	[prod-print2] §5.9.1.1
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print2] §5.8.1.2
media-col	collection					MAY	[prod-print2] §5.8.1.2

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[30] 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.

[31] The effect of the IPP "page-ranges" 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	[prod-print] §3.18
separator-sheets-type	type3 keyword | name(MAX)				MUST	MUST	[prod-print] §3.18.1
media	type3 keyword | name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.18.2
media-col	collection					MAY	[prod-print] §3.18.2
sheet-collate	type2 keyword	y	y	n	MAY	MAY	[job-prog] §3.1
sides	type2 keyword	y	y	y	MAY	MAY	[RFC2911] §4.2.8
x-image-position	type2 keyword	y	y	y	MAY	MAY	[prod-print] §3.19.2
x-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.3
x-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.4
x-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.5
y-image-position	type2 keyword	y	y	y	MAY	MAY	[prod-print] §3.19.6
y-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.7
y-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.8
y-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.9

1388

1389 7.1 Job Template attributes defined for use with the Document object

1390 This section defines additional Job Template attributes for use with the Document object.

1391 7.1.1 job-copies (integer(1:MAX))   Job Template attribute

1392 This attribute specifies the number of job copies, i.e., with all of the Document objects taken together. Its
1393 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the
1394 "copies" Job Template attribute defined in [RFC2911] section 4.2.5 which switches between job copies and
1395 document copies depending on the value of the "multiple-document-handling" Job Template attribute.

1396 7.1.2 job-cover-back (collection)   Job Template attribute

1397 This attribute specifies the cover for the back of the job, i.e., with all of the Document objects taken together and is
1398 independent of the value of the "multiple-document-handling" Job Template attribute. The member attributes are the
1399 same as "cover-back" (see [prod-print] section 3.1). However, the "cover-back" Job Template attribute switches
1400 between a job back cover and a document back cover depending on the value of the "multiple-document-handling"
1401 Job Template attribute.

1402 7.1.3 job-cover-front (collection)   Job Template attribute

1403 This attribute specifies the cover for the front of the job, i.e., with all of the Document objects taken together and is
1404 independent of the value of the "multiple-document-handling" Job Template attribute. The member attributes are the
1405 same as the "cover-front" Job Template attribute (see [prod-print] section 3.2). However, the "cover-front" Job
1406 Template attribute switches between a job front cover and a document front cover depending on the value of the
1407 "multiple-document-handling" Job Template attribute.

1408 7.1.4 job-finishings (1setOf type2 enum)   Job Template attribute

1409 This attribute specifies the job finishings, i.e., with all of the Document objects taken together. Its interpretation is
1410 independent of the value of the "multiple-document-handling" Job Template attribute. See the "finishings" Job

1411 Template attribute defined in [RFC2911] section 4.2.6 which switches between job finishings and document
1412 finishings depending on the value of the "multiple-document-handling" Job Template attribute.

7.1.5 job-finishings-col (1setOf collection)   Job Template attribute

1414 This attribute specifies the job finishings collection, i.e., with all of the Document objects taken together. Its
1415 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the
1416 "finishings" Job Template attribute defined in [RFC2911] section 4.2.6 which switches between job finishings
1417 collection and document finishings collection depending on the value of the "multiple-document-handling" Job
1418 Template attribute.

8   Job Description and Document Description attributes

1420 Table 9 lists all the Job Description defined in other IPP specifications and the corresponding Document Description
1421 attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and
1422 Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute
1423 values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes
1424 as flagged with "**".

1425 The column labeled "attribute syntax" indicates the attribute syntax (see [RFC2911] section 4.1). The Printer
1426 conformance is indicated along with the reference to the specification in which the attribute is defined. The
1427 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
1428 corresponding Job Description attributes.

1429 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
1430 object with a state and it cannot be queried.

1431 Legend:
1432 [job-]   indicates an attribute that shouldn't have had a "job-" prefix in its name in [RFC2911], so that the same
1433   attribute name could also be used for the Document object as a Document Description attribute. Note: For
1434   the PWG Semantic Model, the "job-" prefix is dropped.
1435 "-"   indicates that the Job or Document attribute is *not* defined.
1436 **   indicates a Job and/or Document Description attribute that the client MAY supply the values for in a
1437   corresponding Operation attribute.   See Table 6 for the corresponding operation attribute.
1438 (r/w)   indicates that the Job Description or Document Description attribute is read/write, so that the client can
1439   changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 3.8).

1440   **Table 9 - Job and Document Description attributes**

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference
attributes-charset **	charset	y	y	MUST	[RFC2911] §4.3.19
attributes-natural-language **	naturalLanguage	y	y	MUST	[RFC2911] §4.3.20
compression **	type3 keyword	y	y	MUST	[RFC2911] §3.2.1.1
current-page-order	type2 keyword	y	y	MAY	[prod-print] §4.1
date-time-at-completed	dateTime	y	y	MAY	[RFC2911] §4.3.14.7
date-time-at-creation	dateTime	y	y	MAY	[RFC2911] §4.3.14.5
date-time-at-processing	dateTime	y	y	MAY	[RFC2911] §4.3.14.6
document-format **	documentFormat	y	y	MUST	[RFC2911] §3.2.1.1

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference
document-id-uri	uri	-	y	MUST	[this spec] §8.2
document-message (r/w)	text(127)	-[33]	y	MAY	[this spec] §8.10
document-name (r/w) **	name(MAX)	y	y	MUST	[RFC2911] §3.2.1.1
document-natural-language **	naturalLanguage	y	y	MAY	[RFC2911] §3.2.1.1
document-number	integer(0:MAX)	-	y	MUST	[this spec] §8.1
document-printer-up-time	integer(1:MAX)	-	y	MUST	[this spec] §8.11
document-state	type1 enum	-	y	MUST	[this spec] §8.5.2
document-state-message	text(MAX)	-	y	MAY	[this spec] §8.9
document-state-reasons	1setOf type2 keyword	-	y	MUST	[this spec] §8.7
document-uri **	uri	-	y	MAY	[this spec] §8.3
impressions-completed-current-copy	integer(0:MAX)	y	y	MAY	[job-prog] §4.4
job-collation-type	type2 enum	y	-	MAY	[job-prog] §4.1
[job-]detailed-status-message	1setOf text (MAX)	y	y	MAY	[RFC2911] §4.3.10
[job-]document-access-errors	1setOf text(MAX)	y	y	MAY	[RFC2911] §4.3.11
job-id	integer(1:MAX)	y	-[34]	MUST	[RFC2911] §4.3.2
[job-]impressions **	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.17.2
[job-]impressions-completed	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.18.2
[job-]k-octets **	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.17.1
[job-]k-octets-processed	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.18.1
[job-]media-sheets **	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.17.3
[job-]media-sheets-completed	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.18.3
job-message-from-operator	text(127)	y	-[35]	MAY	[RFC2911] §4.3.16
[job-]more-info	uri	y	y	MAY	[RFC2911] §4.3.4
job-name (r/w)	name(MAX)	y	-[36]	MUST	[RFC2911] §4.3.5
job-originating-user-name	name (MAX)	y	-	MUST	[RFC2911] §4.3.6
job-printer-make-and-model	text(127)	y	-	CMUST[37]	[RFC2911] §4.3.14.4
job-printer-up-time	integer (1:MAX)	y		MUST	[RFC2911] §4.3.14.4
job-printer-uri	uri	y	-	MUST	[RFC2911] §4.3.3
job-state	type1 enum	y	-[38]	MUST	[RFC2911] §4.3.7
job-state-message	text(MAX)	y	-[39]	MAY	[RFC2911] §4.3.9
job-state-reasons	1setOf type2 keyword	y	-[40]	MUST	[RFC2911] §4.3.8

---

[33] 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 [prod-print] section 3.10) for user to operator communication.

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

[35] 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 8.10) to communicate with each other.

[36] The Document Description attribute that corresponds to the "job-name" Job Description attribute is the (existing) "document-name" attribute defined in [RFC2911].

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

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

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

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference
job-uri	uri	y	-[41]	MUST	[RFC2911] §4.3.1
[job-]warnings-count	integer(0:MAX)	y	y	MAY	[override] §6.1
**last-document ** **	boolean	-	y	MAY	[RFC2911] §4.3.12
number-of-documents	integer(0:MAX)	y	-	MAY	[RFC2911] §4.3.15
number-of-intervening-jobs	integer(0:MAX)	y	-	MAY	[RFC2911] §4.3.13
output-device-assigned	name(127)	y	-	MAY	[RFC2911] §4.3.7.2
sheet-completed-copy-number	integer(0:MAX)	y	y	MAY	[job-prog] §4.2
sheet-completed-document-number	integer(0:MAX)	y	-	MAY	[job-prog] §4.3
time-at-completed	integer (MIN:MAX)	y	y	MUST	[RFC2911] §4.3.14.3
time-at-creation	integer (MIN:MAX)	y	y	MUST	[RFC2911] §4.3.14.1
time-at-processing	integer (MIN:MAX)	y	y	MUST	[RFC2911] §4.3.14.2

1441   "**" See the description in the Legend before the table.
1442
1443   Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
1444   individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
1445   Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning. faxing,
1446   formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
1447   most can apply to other types of service as well. The reason for separating state from reasons, is so that the states
1448   can be the fundamental states that most implementations have, while the state reasons can vary depending on the
1449   sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
1450   reasons are more information, both for programs and people.

1451   The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the
1452   existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid
1453   understanding and implementation and so that future maintenance will continue this strong parallelism. The "/"
1454   character separates the words: Job from Document so that the same description can serve for both Job and
1455   Document objects.

1456   8.1   document-number (integer(1:MAX))   Document Description attribute

1457   This REQUIRED Document Description attribute is the ordinal number of the document within the job which
1458   determines its order of being printed in a multi-document job. The Printer generates the values monotonically
1459   increasing from 1 for a job. However, the client MAY supply the value in the "input-document-number" operation
1460   attribute (see section 3.1.1.1).

1461   8.2   document-id-uri (uri)   Document Description attribute

1462   This REQUIRED Document Description attribute is generated by the Printer as a unique URI to identify a Document
1463   object, in the same way that the "job-uri" (uri) Job Description attribute uniquely identifies a Job object. Unlike the
1464   "job-uri" (uri) attribute, the client cannot supply this attribute as a target of an operation.

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[40] The Document Description attribute that corresponds to the "job-state-reasons" Job Description attribute is the (new) "document-state-reasons" attribute.
[41] The Document Description attribute that corresponds to the "job-uri" (uri) Job Description attribute is the (new) "document-id-uri" (uri) attribute. However, the value is only a unique ID. The client cannot use the "document-id-uri" attribute URI value as a target of a Document object operation; the "job-uri" has proved problematic enough as a target.

1465 **8.3 document-uri (uri)** **Document Description attribute**

1466 This Document Description attribute is the URI that the client supplied in a Send-URI operation. The Printer MUST
1467 support this attribute if the Printer supports the Send-URI operation (see section 3.4).

1468 **8.4 job-state (type1 enum)** **Job Description attribute**

1469 **8.5 document-state (type1 enum)** **Document Description attribute**

1470 The REQUIRED "job-state" and the REQUIRED "document-state" attribute identify the current state of the job and
1471 document, respectively. Even though IPP defines seven values for job/document states (plus the out-of-band
1472 'unknown' value - see [RFC2911] section 4.1), implementations only need to support those states which are
1473 appropriate for the particular implementation. In other words, an IPP Printer object implementation supports only
1474 those job/document states implemented by the output device and available to the IPP Printer object implementation.

1475 Table 10 lists the "job-state" and "document-state" attribute values.

1476 **Table 10 - "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

1477

1478 The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state"
1479 attributes or just the "job-state" attribute as indicated in Table 10. 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,

Value	Symbolic Name and Description
	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 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-

Value	Symbolic Name and Description
	state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.

1480 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
1481 job/document altogether. The length of time that jobs/document remain in the 'canceled', 'aborted', and 'completed'
1482 states depends on implementation.

1483 Jobs/documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the jobs/documents
1484 have completed all activity, including stacking output media, after the jobs/documents have completed all activity,
1485 and all job/document status attributes have reached their final values for the job/document.

8.5.1 The "job-state" Job Description attribute and the Job Life Cycle

1487 The "job-state" attribute is one of the most important Job Description attributes. Figure 1 shows the values of the
1488 "job-state" attribute and the Job object life cycle as affected by actions on the Job, Printer, and job processing.
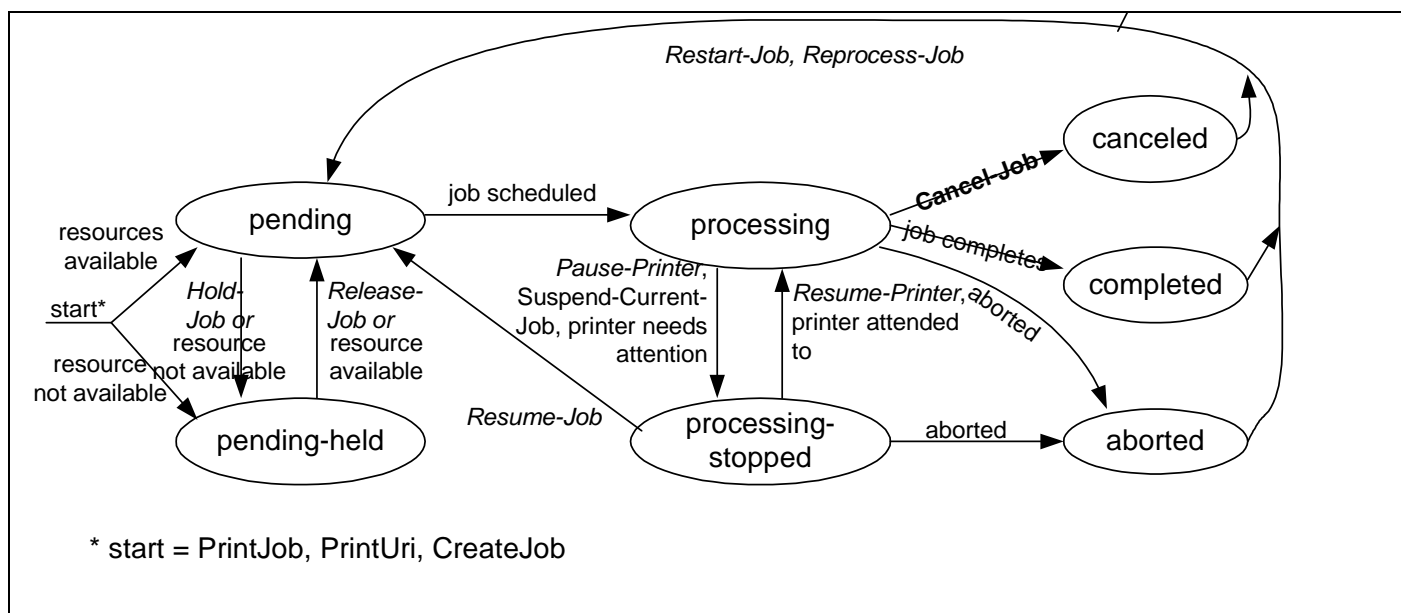
1489

1490 **Figure 1 - The "job-state" Job Description attribute and the Job object life cycle**

1491 Normally a job progresses from left to right. Other state transitions are unlikely, but are not forbidden. Not shown
1492 are the transitions to the 'canceled' state from the 'pending', 'pending-held', and 'processing-stopped' states.

8.5.2 The "document-state" Document Description attribute and the Document object life Cycle

1495 The "document-state" attribute is one of the most important Document Description attributes. Figure 2 shows the
1496 values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job,
1497 Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the
1498 lifecycle of a Job[42]. Documents basically have three states.   The first is waiting to be processed by a Job (i.e.

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[42] 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

1499 pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it
1500 reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed,
1501 canceled, or aborted).

1502
1503
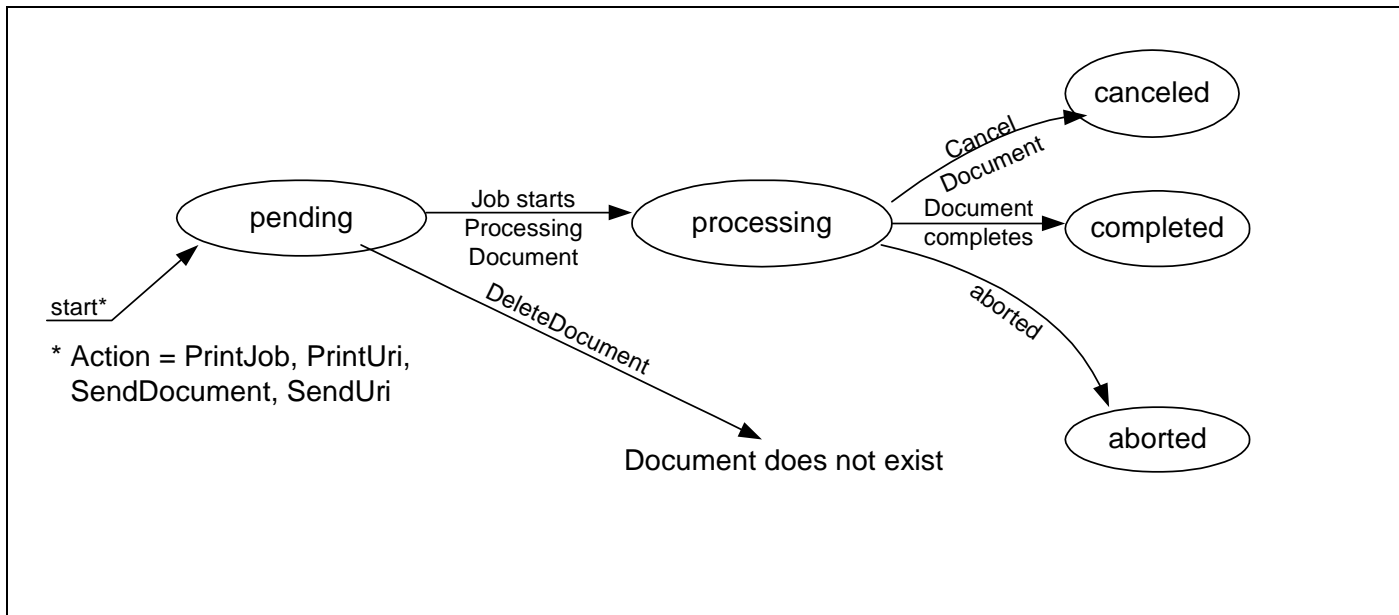
1504

1505 **Figure 2 - The "document-state" Document Description attribute and the Document object life Cycle**

1506 A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right
1507 in the state diagram. No other state transitions are defined.

1508 ## 8.5.3 Forwarding Servers

1509 As with all other IPP attributes, if the implementation can not determine the correct value for this attribute, it SHOULD
1510 respond with the out-of-band value 'unknown' (see [RFC2911] Section 4.1) rather than try to guess at some possibly
1511 incorrect value and give the end user the wrong impression about the state of the Job/Document object. For
1512 example, if the implementation is just a gateway into some printing system from which it can normally get status, but
1513 temporarily is unable, then the implementation should return the 'unknown' value. However, if the implementation is
1514 a gateway to a printing system that never provides detailed status about the print job/document, the implementation
1515 MAY set the IPP Job/Document object's state to 'completed', provided that it also sets the 'queued-in-device' value in
1516 the job's/document's "job-state-reasons"/"document-state-reasons" attribute (see "job-state-reasons"/"document-
1517 state-reasons" attribute below).

1518 ## 8.5.4 Partitioning of Job/Document States

1519 This section partitions the job/document states into phases: Job/Document Not Completed, Job/Document
1520 Retention, Job/Document History, and Job/Document Removal. This section also explains the 'job-restartable' value
1521 of the "job-state-reasons" Job Description attribute for use with the Restart-Job operation.

1522 **Job**/Document **Not Completed**: When a job is in the 'pending', 'pending-held', 'processing', or 'processing-stopped'
1523 states, the job is not completed. When a Document is in the 'pending' or 'processing' state, it is not completed.

---

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.

1524   **Job Retention**: When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP
1525   Printer object MAY "retain" the job in a restartable condition for an implementation-defined time period. This time
1526   period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While
1527   in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job
1528   operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by
1529   adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see Section 8.6) during the Job Retention
1530   phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-Documents
1531   operations MUST be supported while the job is in the Job Retention phase.

1532   **Job History**: After the Job Retention phase expires for a job, the Printer object deletes the document data for the
1533   job and the job becomes part of the Job History. The Printer object MAY also delete any number of the job and
1534   document attributes. Since the job is no longer restartable, the Printer object MUST remove the 'job-restartable'
1535   value from the job's "job-state-reasons" attribute, if present. If the implementation supports the Document object, it
1536   SHOULD retain at least the "document-state" and "document-state-reasons" attributes on the Document object
1537   during the Job History phase which can be queried using the Get-Document-Attributes and Get-Documents
1538   operations.

1539   **Job Removal**: After the job has remained in the Job History for an implementation-defined time, such as when the
1540   number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer
1541   removes the Job and Document objects from the system.

1542   Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" operation
1543   attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-
1544   Documents operation and supplying the 'completed' value for the "which-jobs" operation attribute, a client is
1545   requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-
1546   Document-Attributes operation, a client is requesting a job/documents in any phase except Job Removal. After Job
1547   Removal, the Get-Job-Attributes/Get-Document-Attributes and Get-Jobs/Get-Documents operations no longer are
1548   capable of returning any information about a job/document.

1549   NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1550   ## 8.6   job-state-reasons (1setOf type2 keyword)   **Job Description attribute**

1551   ## 8.7   document-state-reasons (1setOf type2 keyword) Document Description attribute

1552   The REQUIRED "job-state-reasons" and the REQUIRED "document-state-reasons" attributes provide additional
1553   information about the job's and each document's current state, i.e., information that augments the value of the job's
1554   "job-state" attribute and each Document's "document-state" attribute, respectively. The Printer SHOULD support the
1555   same values for both the "job-state-reasons" and the "document-state-reasons" attribute for those attributes that are
1556   defined for both as indicated in the "Job" and "Doc" columns in Table 11.

1557   These values MAY be used with any job or document state or states for which the reason makes sense. Some of
1558   these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when
1559   implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the
1560   reason no longer applies whether the value of the Job's "job-state" attribute or the Document's "document-state"
1561   attribute changed or not. When the Job or Document does not have any reasons for being in its current state, the
1562   value of the Job's "job-state-reasons" attribute or Document's "document-state-reasons" attribute MUST be 'none'.

1563   Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1564   until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1565   objects are passive objects operated on by the containing Job object.

1566 Note: While values cannot be added to the "job-state" or "document-state" attributes without impacting deployed
1567 clients that take actions upon receiving "job-state" or "document-state" values, it is the intent that additional "job-
1568 state-reasons" and "document-state-reasons' values can be defined and registered without impacting such deployed
1569 clients. In other words, the "job-state-reasons" and the "document-state-reasons" attributes are intended to be
1570 extensible.

1571 Table 11 lists the standard keyword values for the "job-state-reasons" and/or "document-state-reasons" attributes
1572 defined in this and other IPP specifications as indicated in the References column. In Table 11 the keywords are
1573 listed in alphabetic order (observing the "[job-]" prefix), while in their descriptions following Table 11, they are listed in
1574 the most likely order of occurrence to help understanding.

1575 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
1576 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.
1577 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
1578 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
1579 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1580 **Notation:**
1581 [job-]   indicates a state reason keyword value that has the 'job-' prefix when it is a value of the "job-state-reasons"
1582   attribute, but does not have the 'job-' prefix when it is a value of the "document-state-reasons" attribute[43].
1583   For purposes of sorting in Table 11, the "[job-]" prefix is observed, since this is an IPP specification.
1584 "-"   indicates that the Job or Document value is *not* defined.

1585   **Table 11 - "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	-[44]	MUST	[RFC2911] §4.3.8
document-state-reasons	1setOf type2 keyword	-	y	MUST	[this spec] §8.7
	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	[prod-print2] §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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[43] 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.
[44] 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	[prod-print2] §8.3.1
	job-saved-successfully	y	-	MAY	[prod-print2] §8.3.1
	job-save-error	y	-	MAY	[prod-print2] §8.3.1
	job-saving	y	-	MAY	[prod-print2] §8.3.1
	job-scheduling	y	-	MAY	[prod-print2] §8.3.1
	[job-]spooling	y	y	MAY	[prod-print2] §8.3.1
	[job-]streaming	y	y	MAY	[prod-print2] §8.3.1
	job-suspended	y	-	MAY	[adm-ops] §9.1
	job-suspended-by-operator	y	-	MAY	[prod-print2] §8.3.1
	job-suspended-by-system	y	-	MAY	[prod-print2] §8.3.1
	job-suspended-by-user	y	-	MAY	[prod-print2] §8.3.1
	job-suspending	y	-	MAY	[prod-print2] §8.3.1
	[job-]transforming	y	y	MAY	[RFC2911] §4.3.8
	[job-]warnings-detected	y	y	MAY	[override] §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	[prod-print2] §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	[prod-print] §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

1586
1587 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
1588 to occur (if implemented), starting with the 'none' value. Note: The order is improved over that in [RFC2911]. The
1589 (JD), (J), and (D) notation is identical to the "Job" and "Doc" columns in Table 11 indicating whether the keyword is
1590 defined for the "job-state-reasons" and/or "document-state-reasons" attributes:

1591 **'none' (JD):** There are no reasons for the job's or document's current state. This state reason is
1592 semantically equivalent to "job-state-reasons" or "document-state-reasons" attribute without any
1593 value and MUST be used when there is no other value, since the 1setOf attribute syntax requires at
1594 least one value.

1595 **'job-hold-until-specified' (J)**: The value of the job's "job-hold-until" attribute was specified with a time
1596 period that is still in the future. The job MUST NOT be a candidate for processing until this reason is
1597 removed and there are no other reasons to hold the job. This value SHOULD be supported if the
1598 "job-hold-until" Job Template attribute is supported.

1599 **'job-password-wait' (J)**: The Job is currently being held until the correct password is entered at the device.
1600 If the "job-password" (octetString(255)) Operation attribute (See [prod-print2] section 4.1) is
1601 supported, this value MUST be supported.

1602 **'proof-print-wait' (J)**: The job is currently being held until the operator verifies the output of the proof print
1603 and performs a Release-Job operation. If the "proof-print" (collection) Job Template attribute (See
1604 [prod-print2] section 5.9) is supported, this value MUST be supported.

1605 **'resources-are-not-supported' (JD)**: At least one of the resources needed by the job/document, such as
1606   media, fonts, resource objects, etc., is not supported on any of the physical printers for which the
1607   job/document is a candidate. This condition MAY be detected when the job/document is accepted,
1608   or subsequently while the job/document is pending or processing, depending on implementation.
1609   The job/document may (1) remain in its current state, (2) be moved to the 'pending-held' state,
1610   depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer
1611   is put into the 'stopped' state when the job/document is attempted to be processed on the Printer.
1612   This value is intended for use with an implementation that supports the "user-defined-values-
1613   supported" Printer attribute (see [prod-print] section 6.1) which allows a job to be accepted with an
1614   unsupported 'name' value.

1615 **'resources-are-not-ready' (JD)**: At least one of the resources needed by the job/document, such as media,
1616   fonts, resource objects, etc., is not ready on any of the physical printer's for which the job/document
1617   is a candidate. This condition MAY be detected when the job/document is accepted, or
1618   subsequently while the job/document is pending or processing, depending on implementation. The
1619   job/document may remain in its current state or be moved to the 'pending-held' state, depending on
1620   implementation and/or job/document scheduling policy.

1621 **'[job-]incoming' (JD)**: Either (1) the Printer has accepted the Create-Job operation and is expecting
1622   additional Send-Document and/or Send-URI operations or (2) the Printer is retrieving/accepting
1623   document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation.

1624 **'[job-]spooling' (JD)**: Same as 'job-incoming' with the specialization that the Printer is spooling the
1625   Job/Document data before processing it. This value corresponds to the 'spool' or 'automatic' value of
1626   the "job-spooling-supported" Printer Description attribute.

1627 **'[job-]streaming' (JD)**: Same as 'job-incoming' with the specialization that the Printer is processing the
1628   Job/Document data as it is being received (that is, the document is not being spooled, but rather is
1629   being processed in chunks by the output device and is being imaged during reception). This value
1630   corresponds to the 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description
1631   attribute.

1632 **'job-data-insufficient' (J)**: The Create-Job operation has been accepted by the Printer, but the Printer is
1633   expecting additional document data before it can move the job into the 'processing' state. If a Printer
1634   starts processing before it has received all data, the Printer removes the 'job-data-insufficient'
1635   reason, but the 'job-incoming' remains. If a Printer starts processing after it has received all data, the
1636   Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same time.

1637 **'unsupported-compression' (JD)**: The job/document was aborted by the system because the Printer
1638   determined while attempting to decompress the document-data's that the compression is actually not
1639   among those supported by the Printer. This value MUST be supported, since "compressions is a
1640   REQUIRED operation attribute.

1641 **'compression-error' (JD)**: The job/document was aborted by the system because the Printer encountered
1642   an error in the document-data while decompressing it. If the Printer posts this reason, the document-
1643   data has already passed any tests that would have led to the 'unsupported-compression' job-state-
1644   reason/document-state-reason.

1645 **'document-access-error' (JD)**: After accepting a Print-URI or Send-URI request, the Printer could not
1646   access one or more documents passed by reference. This reason is intended to cover any file
1647   access problem, including file does not exist and access denied because of an access control
1648   problem. The Printer MAY also indicate the document access error using the "job-document-access-
1649   errors" Job Description attribute (see the description of "job-document-access-errors" above).
1650   Whether the Printer aborts the job/document and moves the job/document to the 'aborted' job state
1651   or prints all documents that are accessible and moves the job/document to the 'completed'
1652   job/document state and adds the 'completed-with-errors' value in the job's "job-state-reasons" or
1653   document's "document-state-reasons" attribute depends on implementation and/or site policy. This
1654   value SHOULD be supported if the Print-URI or Send-URI operations are supported.

1655 **'unsupported-document-format' (JD)**: The job/document was aborted by the system because the
1656 document-data's document-format is not among those supported by the Printer. If the client
1657 specifies the document-format as 'application/octet-stream', the printer MAY abort the job/document
1658 and post this reason even though the format is a member of the "document-format-supported" printer
1659 attribute, but not among the auto-sensed document-formats. This value MUST be supported, since
1660 "document-format" is a REQUIRED operation attribute.

1661 **'document-format-error' (JD)**: The job/document was aborted by the system because the Printer
1662 encountered an error in the document-data while processing it. If the Printer posts this reason, the
1663 document-data has already passed any tests that would have led to the 'unsupported-document-
1664 format' job-state-reason/document-state-reason.

1665 **'submission-interrupted' (JD)**: The job or document was not completely submitted for some unforeseen
1666 reason, such as: (1) the Printer has crashed before the job was closed by the client, (2) the Printer or
1667 the document transfer method has crashed in some non-recoverable way before the document data
1668 was entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-
1669 out period. See the description of the "multiple-operation-time-out" Printer attribute in [RFC2911]
1670 Section 4.4.31.

1671 **'[job-]outgoing' (JD)**: The Printer is transmitting the job/document to the output device.

1672 **'job-scheduling' (J)**: The printer is in the process of scheduling the processing for the Job.

1673 **'[job-]queued' (JD)**: Job is in the 'processing' state, but more specifically, the Printer has queued the
1674 Document data.

1675 **'[job-]transforming' (JD)**: Job/document is in the 'processing' state, but more specifically, the Printer is
1676 interpreting document data and producing another electronic representation.

1677 **'[job-]interpreting' (JD)**: Job/document is in the 'processing' state, but more specifically, the Printer is
1678 interpreting the document data.

1679 **'[job-]queued-for-marker' (JD)**: Job/document is in any of the 'pending-held', 'pending', or 'processing'
1680 states, but more specifically, the Printer has completed enough processing of the document to be
1681 able to start marking and the job/document is waiting for the marker. Systems that require human
1682 intervention to release jobs using the Release-Job operation, put the job into the 'pending-held' job
1683 state. Systems that automatically select a job to use the marker put the job into the 'pending' job
1684 state or keep the job in the 'processing' job state while waiting for the marker, depending on
1685 implementation. All implementations put the job/document into (or back into) the 'processing' state
1686 when marking does begin.

1687 **'[job-]printing' (JD)**: The output device is marking media. This value is useful for Printers which spend a
1688 great deal of time processing (1) when no marking is happening and then want to show that marking
1689 is now happening or (2) when the job/document is in the process of being canceled or aborted while
1690 the job/document remains in the 'processing' state, but the marking has not yet stopped so that
1691 impression or sheet counts are still increasing for the job/document.

1692 **'printer-stopped-partly' (J)**: The value of the Printer's "printer-state-reasons" attribute contains the value
1693 'stopped-partly'.

1694 **'printer-stopped'** (J): The value of the Printer's "printer-state" attribute is 'stopped'.

1695 **'job-suspending' (J)**: The printer is in the process of moving the Job from a processing condition to a
1696 suspended condition where other jobs can be processed.

1697 **'job-suspended' (J)**: The job has been suspended while processing using the Suspend-Current-Job
1698 operation and other jobs can be processed on the Printer. The Job can be resumed using the
1699 Resume-Job operation which removes this value. Note: Documents cannot be suspended and there
1700 is no Suspend-Current-Document operation.

1701 **'job-suspended-by-operator' (J)**: The Job has been indefinitely suspended by the printer operator.

1702   **'job-suspended-by-user' (J)**: The Job has been indefinitely suspended by the user.

1703   **'job-suspended-by-system' (J)**: The Job has been indefinitely suspended by the Printer's system software
1704   during normal processing of the job.

1705   **'job-resuming' (J)**: The printer is in the process of moving the Job from a suspended condition to become a
1706   candidate for processing.

1707   **'[job-]canceled-by-user' (JD)**: The job/document was canceled by the owner of the job using the Cancel-
1708   Job/Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value
1709   of the originating user that created the Job object, or by some other authorized end-user, such as a
1710   member of the job owner's security group. This 'job-canceled' value SHOULD be supported. The
1711   'canceled-by-user' value SHOULD be supported for the "document-state-reasons" attributes for use
1712   with the Cancel-Document.

1713   **'[job-]canceled-by-operator' (JD)**: The job/document was canceled by the operator using the Cancel-
1714   Job/Cancel-Document request, i.e., by a user who has been authenticated as having operator
1715   privileges (whether local or remote). If the security policy is to allow anyone to cancel anyone's
1716   job/document, then these values may be used when the job/document is canceled by other than the
1717   owner of the job. For such a security policy, in effect, everyone is an operator as far as canceling
1718   jobs/documents is concerned. These values SHOULD be supported if the implementation permits
1719   canceling by other than the owner of the job.

1720   **'[job-]canceled-at-device' (JD)**: The job/document was canceled by an unidentified local user, i.e., a user
1721   at a console at the device. This value SHOULD be supported if the implementation supports
1722   canceling jobs/documents at the console.

1723   **'aborted-by-system' (JD)**: The job/document (1) is in the process of being aborted, (2) has been aborted by
1724   the system and placed in the 'aborted' state, or (3) has been aborted by the system and placed in the
1725   'pending-held' state, so that a user or operator can manually try the job/document again. This value
1726   SHOULD be supported.

1727   **'processing-to-stop-point' (J)**: The requester has issued a Cancel-Job/Cancel-Document operation or the
1728   Printer object has aborted the job/document, but is still performing some actions on the job/document
1729   until a specified stop point occurs or job/document termination/cleanup is completed.
1730   If the implementation requires some measurable time to cancel the job/document in the 'processing'
1731   or 'processing-stopped' job/document states, the Printer MUST use this value to indicate that the
1732   Printer object is still performing some actions on the job/document while the job/document remains in
1733   the 'processing' or 'processing-stopped' state. After all the job's/document's job/document
1734   description attributes have stopped incrementing, the Printer object moves the job/document from
1735   the 'processing' state to the 'canceled' or 'aborted' job/document states.

1736   **'service-off-line' (J)**: The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the
1737   'pending-held' state. This situation could be true if the service's or document transform's input is
1738   impaired or broken.

1739   **'[job-]warnings-detected' (JD)**: If the Printer supports these values, the Printer MUST add the value to "job-
1740   state-reasons" / "document-state-reasons" when it generates the first warning message. That is, a
1741   single occurrence of this value is present in the "job-state-reasons" / "document-state-reasons" if the
1742   Printer has generated one or more warnings.

1743   **'[job-]completed-successfully' (JD)**: The job/document completed successfully. There were no warnings
1744   or errors in printing. This value SHOULD be supported.

1745   **'[job-]completed-with-warnings' (JD)**: The print part of the job/document completed with warnings
1746   (whether or not there were save errors). This value SHOULD be supported if the implementation
1747   detects warnings. [RFC2911]

1748   **'[job-]completed-with-errors' (JD)**: The print part of the job/document completed with errors (and possibly
1749   warnings too) (whether or not there were save errors). This value SHOULD be supported if the
1750   implementation detects errors. [RFC2911]

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

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

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

'job-restartable' (J): This job is retained (see the description of "job-state" above, specifically "Partitioning of Job States") and is currently able to be restarted using the Restart-Job operation (see [RFC2911] Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer MUST accept a Restart-Job operation for that job. This value SHOULD be supported if the Restart-Job operation is supported.

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

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

8.8 job-state-message (text(MAX))   Job Description attribute

8.9 document-state-message (text(MAX))   Document Description attribute

This OPTIONAL attribute specifies information about the "job-state"/"document-state" and "job-state-reasons"/"document-state-reasons" attributes in human readable text. If the Printer object supports this attribute, the Printer object MUST be able to generate this message in any of the natural languages identified by the Printer's "generated-natural-language-supported" attribute (see the "attributes-natural-language" operation attribute specified in [RFC2911] Section 3.1.4.1).

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

8.10 document-message (text(127))   Document Description

ISSUE 02: Should the "document-message" Document Description attribute have a maximum of 127 octets, like the "job-message-from-operator" (text(127)) Job Description attribute in [RFC2911] section 4.3.16 or MAX (1023 octets) like "job-message-to-operator" (text(MAX)) Job Template attribute in IEEE-ISTO 5100.3 [prod-print] section 3.10?

This OPTIONAL Document Description contains a message from the user to the operator or a message from the operator or administrator system administrator or "intelligent" process to indicate to the end user the reasons for modification or other management action taken on the Document. The Printer populates this Document Description attribute from the "document-message" (text(127) operation attribute value supplied by the client in any of the Document Creation operations (see section 3.1.1) or in a Cancel-Document or Cancel-Current-Document operations (see sections 3.9 or 3.10). In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-Document-Attributes operation (see section 3.8).

1791 **8.11 document-printer-up-time (integer(1:MAX))**   **Document Description**

1792 This REQUIRED Document Description attribute indicates the amount of time (in seconds) that the Printer
1793 implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description
1794 attribute (see [RFC2911] section 4.4.29).

1795 A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value
1796 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes
1797 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of
1798 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-
1799 xxx" event occurred by subtracting this difference from the client's wall-clock time.

1800 ISSUE 03: The following 4 Job Creation operation attributes have corresponding Job Description attributes, but
1801 there isn't a definition or an IANA Registration for any of these Job Description attributes: "ipp-attribute-fidelity", "job-
1802 mandatory-attributes", "job-password", and "job-password-encryption". OK to add Job Description attribute
1803 descriptions for each of them? That would correspond to the PWG Semantic Model where they are Job Description
1804 attributes.

1805 ISSUE 04 repeat: The following 4 Job Creation operation attributes have corresponding Job Description attributes,
1806 since they are really Document attributes: "compression", "document-format", "document-name", "document-natural-
1807 language"? OK to add Document Description attribute descriptions for each of them? That would correspond to the
1808 PWG Semantic Model where they are Document Description attributes.

1809 ISSUE 05: The Printer copies the following 11 Document Creation operation attributes to corresponding Document
1810 Description attributes, but there isn't a definition or an IANA Registration for any of these Document Description
1811 attributes: "attributes-charset", "attributes-natural-language", "compression", "document-format", "document-name",
1812 "document-natural-language", "impressions", "k-octets", "media-sheets", "job-printer-uri", and "last-document". OK to
1813 add operation attribute and Document Description attribute descriptions for each of them?

1814 ISSUE 06: The definitions of the following 16 remaining Document Description attributes are derived from the
1815 corresponding Job Description attributes that are not set by the client: "current-page-order", "date-time-at-
1816 completed", "date-time-at-creation", "date-time-at-processing", "detailed-status-message", "document-access-errors",
1817 "impressions-completed", "impressions-completed-current-copy", "k-octets-processed", "media-sheets-completed",
1818 "more-info", "sheet-completed-copy-number", "time-at-completed", "time-at-creation", "time-at-processing", and
1819 "warnings-count", OK to add Document Description attribute descriptions for each of them?

1820 # 9   Printer attributes

1821 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three
1822 disjoint groups:
1823

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 "finishing".
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. |

1824

1825 In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT) or Printer
1826 Description (PD) groups by supplying the 'job-template' or 'printer-description' group name, respectively. The client
1827 can also request "all". The column labels are:

1828 "**Attribute Syntax**" - indicates the attribute syntax (see [RFC2911] section 4.1). Many "xxx-default" and "xxx-
1829 supported" attributes have the 'collection' syntax which consists of a number of member attributes.
1830 These member attributes are not listed in this table when they are the same as the corresponding
1831 "xxx" attribute in Table 8. Only those few Printer attribute collection attributes that do not have a
1832 corresponding Job Template attributes show the member attributes in this table.

1833 "**Grp**" - indicates to which group the attribute belongs.

1834 "**Printer Conf.**" - indicates the IPP/1.1 Printer conformance requirements for supporting the attribute. Those
1835 attributes labeled as "MAY" may have conditional requirements that require their support, if the
1836 Printer supports a related attribute, operation, or feature. For example, all Job Template attributes
1837 are OPTIONAL for a Printer to support. However, if a Printer supports Job Template attribute "xxx",
1838 then it MUST also support the corresponding "xxx-default" and "xxx-supported" attributes. Similarly,
1839 if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become
1840 MUST.

1841 "**Reference**" - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1842   **Table 12 - 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	[prod-print] §3.1.3
cover-back-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.1.4
cover-front-default	collection	JT	MAY	[prod-print] §3.1.3
cover-front-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.1.4
cover-type-supported	1setOf type2 keyword	-	MAY	[prod-print] §3.1.2.1
document-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[this-spec] §9.1
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	[set-ops] §6.3
document-overrides-supported	1setOf type2 keyword		MAY	[override] §5.1.14
finishings-col-default	collection	JT	MAY	[prod-print] §3.2.3
finishings-col-ready	1setOf collection	JT	MAY	[prod-print] §3.2.4
finishings-col-supported	1setOf type2 keyword	JT	MAY	[prod-print] §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	[prod-print] §3.2.1.1
force-front-side-default	1setOf integer(1:MAX)	JT	MAY	[prod-print] §3.3
force-front-side-supported	rangeOfInteger(1:MAX)	JT	MAY	[prod-print] §3.3
generated-natural-language-	1setOf naturalLanguage	PD	MUST	[RFC2911] §4.4.20

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Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
supported				
imposition-template-default	type3 keyword | name(MAX)	-	MAY	[prod-print] §3.4
imposition-template-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.4
insert-after-page-number-supported	rangeOfInteger(0:MAX)	-	MAY	[prod-print] §3.5.1.1
insert-count-supported	rangeOfInteger(0:MAX)	-	MAY	[prod-print] §3.5.2.1
insert-sheet-default	1setOf collection	JT	MAY	[prod-print] §3.5.4
insert-sheet-supported	1setOf type2 keyword	JT	MAY	[prod-print] §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	[prod-print] §3.6
job-account-id-supported	boolean	JT	MAY	[prod-print] §3.6
job-accounting-output-bin-default	type3 keyword | name(MAX)	-	MAY	[prod-print] §3.8.3.1
job-accounting-output-bin-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.8.3.2
job-accounting-sheets-default	collection	JT	MAY	[prod-print] §3.8.4
job-accounting-sheets-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.8.5
job-accounting-sheets-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.8.1.1
job-accounting-user-id-default	name(MAX)	JT	MAY	[prod-print] §3.7
job-accounting-user-id-supported	boolean	JT	MAY	[prod-print] §3.7
job-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[prod-print2] §7.1
job-error-sheet-default	collection	JT	MAY	[prod-print] §3.7
job-error-sheet-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.9.5
job-error-sheet-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.9.1.1
job-error-sheet-when-supported	1setOf type2 keyword	-	MAY	[prod-print] §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	[prod-print] §3.12
job-message-to-operator-supported	boolean	JT	MAY	[prod-print] §3.12
job-password-supported	integer(0:127)	PD	MAY	[prod-print2] §7.2
job-password-encryption-supported	1setOf (type3 keyword | name(MAX))	PD	MAY	[prod-print2] §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	[set-ops] §6.2
job-sheet-message-default	text(MAX)		MAY	[prod-print] §3.12
job-sheet-message-supported	boolean		MAY	[prod-print] §3.12
job-sheets-col-default	collection	JT	MAY	[prod-print] §3.11.3
job-sheets-col-supported	1setOf type2 keyword	JT	MAY	[prod-print] §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	[prod-print2] §7.4
max-save-info-supported	integer(1:MAX)	PD	MAY	[prod-print2] §7.5

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
max-stitching-locations-supported	integer(1:MAX)	PD	MAY	[prod-print] §5.2
media-back-coating-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.13.10.2
media-col-database	1setOf collection	-[45]	MAY	[prod-print2] §7.6
any "media-col" member attribute				
media-col-default	collection	JT	MAY	[prod-print] §3.13.12
any "media-col" member attribute				
media-color-supported	1setOf type2 keyword	-	MAY	[prod-print] §3.13.4.1
media-col-ready	1setOf collection	JT	MAY	[prod-print] §3.13.13
any "media-col" member attribute				
media-col-supported	1setOf type2 keyword	JT	MAY	[prod-print] §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	[prod-print] §3.13.10.1
media-hole-count-supported	1setOf rangeOfInteger(0:MAX)	-	MAY	[prod-print] §3.13.6.1
media-info-supported	boolean	-	MAY	[prod-print] §3.13.3.1
media-input-tray-check-default	type3 keyword | name(MAX)	JT	MAY	[prod-print] §3.14
media-input-tray-check-supported	1setOf (type3 keyword | name(MAX))	JT	MAY	[prod-print] §3.14
media-key-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.13.1.1
media-order-count-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[prod-print] §3.13.7.1
media-pre-printed-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §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	[prod-print] §3.13.11.1
media-size-supported	1setOf collection	-	MAY	[prod-print] §3.13.8.3
media-supported	1setOf (type3 keyword | name(MAX))	JT	MAY	[RFC2911] §4.2.11
media-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.13.2.1
media-weight-metric-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[prod-print] §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

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[45] 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
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	[output-bin] §2.1
output-bin-supported	1setOf (type2 keyword | name(MAX))	JT	MAY	[output-bin] §2.1
page-delivery-default	type2 keyword	JT	MAY	[prod-print] §3.15
page-delivery-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.15
page-order-received-default	type2 keyword	JT	MAY	[prod-print] §3.16
page-order-received-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.16
page-overrides-supported	1setOf type2 keyword	PD	MAY	[override] §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	[override] §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
presentation-direction-number-up-default	type2 keyword	JT	MAY	[prod-print] §3.17
presentation-direction-number-up-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.17
printer-current-time	dateTime	PD	MAY	[RFC2911] §4.4.30
printer-detailed-status-messages	1setOf text(MAX)	PD	MAY	[prod-print2] §7.7
printer-driver-installer	uri	PD	MAY	[RFC2911] §4.4.8
printer-info	text(127)	PD	MAY	[RFC2911] §4.4.6
printer-is-accepting-jobs	boolean	PD	MUST	[RFC2911] §4.4.23
printer-location	text(127)	PD	MAY	[RFC2911] §4.4.5
printer-make-and-model	text(127)	PD	MAY	[RFC2911] §4.4.9
printer-message-date-time	dateTime	PD	MAY	[set-ops] §6.5
printer-message-from-operator	text(127)	PD	MAY	[RFC2911] §4.4.25
printer-message-time	integer(MIN:MAX)	PD	MAY	[set-ops] §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	[set-ops] §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 attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
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	[set-ops] §6.6
xri-uri	uri	PD	MUST	[set-ops] §6.6
xri-authentication	1setOf type2 keyword	PD	MUST	[set-ops] §6.6
xri-security	1setOf type2 keyword	PD	MUST	[set-ops] §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	[prod-print] §3.18.3
separator-sheets-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.18.4
separator-sheets-type-supported	1setOf (type3 keyword | name(MAX))	-	MAY	[prod-print] §3.18.1.1
sheet-collate-default	type2 keyword	JT	MAY	[job-prog] §3.1
sheet-collate-supported	1setOf type2 keyword	JT	MAY	[job-prog] §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	[prod-print] §3.2.2.3.1
stitching-offset-supported	1setOf (integer (0:MAX) | rangeOfInteger(0:MAX))	-	MAY	[prod-print] §3.2.2.2.1
stitching-reference-edge-supported	1setOf type2 keyword		MAY	[prod-print] §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	[prod-print] §5.1
which-jobs-supported	1setOf type2 keyword	PD	MAY	[prod-print2] §7.8
x-image-position-default	type2 keyword	JT	MAY	[prod-print] §3.19.2
x-image-position-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.19.2
x-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.3
x-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.3
xri-authentication-supported	1setOf type2 keyword	PD	MAY	[set-ops] §6.8
xri-security-supported	1setOf type2 keyword	PD	MAY	[set-ops] §6.9
xri-uri-scheme-supported	1setOf uriScheme	PD	MAY	[set-ops] §6.7
x-side1-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.4
x-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.4
x-side2-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.5
x-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.5
y-image-position-default	type2 keyword	JT	MAY	[prod-print] §3.19.6
y-image-position-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.19.6
y-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.7
y-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.7
y-side1-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.8
y-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.8
y-side2-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.9
y-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.9

1843

1844 ## 9.1   document-creation-attributes-supported (1setOf type2 keyword)

1845 This Printer Description attribute lists the keyword names of the Document Template and Operation attributes that
1846 the Printer will accept in the Create-Document, Send-Document, and Send-URI Document Creation operations.

1847 ## 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
	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[46]	[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[47]	[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

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

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	toner-low	MAY	[RFC2911] §4.4.12

1848

1849   This description is taken from [RFC2911] with additions from other IPP extension documents:

1850   This REQUIRED Printer attribute supplies additional detail about the device's state. Some of the these value
1851   definitions indicate conformance requirements; the rest are OPTIONAL.

1852   Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe),
1853   warning, and error (most severe).

1854   **'-report'**: This suffix indicates that the reason is a "report". An implementation may choose to omit some or
1855   all reports. Some reports specify finer granularity about the printer state; others serve as a precursor
1856   to a warning. A report MUST contain nothing that could affect the printed output.

1857   **'-warning'**: This suffix indicates that the reason is a "warning". An implementation may choose to omit some
1858   or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that
1859   prevents a job from completing, though in some cases the output may be of lower quality.

1860   **'-error'**: This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this
1861   attribute contains one or more errors, printer MUST be in the stopped state.

1862   If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an
1863   "error".

1864   If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the
1865   output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a
1866   warning in the Printer's "printer-state-reasons attribute". If the "printer-state" for such a Printer has a value of
1867   'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.

1868   The following standard keyword values are defined (in alphabetical order):

1869   **'other'**: The device has detected an error other than one listed in this document.

1870   **'none'**: There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without
1871   any value and MUST be used, since the 1setOf attribute syntax requires at least one value.

1872   **'connecting-to-device'**: The Printer object has scheduled a job on the output device and is in the process of
1873   connecting to a shared network output device (and might not be able to actually start printing the job
1874   for an arbitrarily long time depending on the usage of the output device by other servers on the
1875   network).

1876   **'cover-open**': One or more covers on the device are open.

1877   **'deactivated'**: A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]
1878   section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.
1879   The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-
1880   Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URI (so that partial job submission can
1881   be completed - see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status
1882   code.

1883   **'developer-empty'**: The device is out of developer.

1884   **'developer-low**': The device is low on developer.

1885   **'door-open'**: One or more doors on the device are open.

1886   **'fuser-over-temp'**: The fuser temperature is above normal.

1887   **'fuser-under-temp'**: The fuser temperature is below normal.

1888   **'hold-new-jobs'**: The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or
1889   other means, but the output-device(s) are taking an appreciable time to stop. Later, when all output
1890   has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-
1891   paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-
1892   New-Jobs operation is supported and the implementation takes significant time to pause a device in
1893   certain circumstances.

1894   **'input-tray-missing'**: One or more input trays are not in the device.

1895   **'interlock-open'**: One or more interlock devices on the printer are unlocked.

1896   **'interpreter-resource-unavailable'**: An interpreter resource is unavailable (i.e. font, form)

1897   **'marker-supply-empty'**: The device is out of at least one marker supply. (e.g. toner, ink, ribbon)

1898   **'marker-supply-low'**: The device is low on at least one marker supply. (e.g. toner, ink, ribbon)

1899   **'marker-waste-almost-full'**: The device marker supply waste receptacle is almost full.

1900   **'marker-waste-full'**: The device marker supply waste receptacle is full.

1901   **'media-empty'**: At least one input tray is empty.

1902   **'media-jam'**: The device has a media jam.

1903   **'media-low'**: At least one input tray is low on media.

1904   **'media-needed'**: A tray has run out of media.

1905   **'moving-to-paused'**: Someone has paused the Printer object using the Pause-Printer operation (see
1906   [RFC2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.
1907   Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value
1908   replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be
1909   supported, if the Pause-Printer operation is supported and the implementation takes significant time
1910   to pause a device in certain circumstances.

1911   **'opc-life-over'**: The optical photo conductor is no longer functioning.

1912   **'opc-near-eol'**: The optical photo conductor is near end of life.

1913   **'output-area-almost-full'**: One or more output area is almost full (e.g. tray, stacker, collator).

1914   **'output-area-full'**: One or more output area is full. (e.g. tray, stacker, collator)

1915   **'output-tray-missing'**: One or more output trays are not in the device

1916   **'paused'**: Someone has paused the Printer object using the Pause-Printer operation (see [RFC2911] section
1917   3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer
1918   MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a
1919   Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that
1920   job when the Printer is no longer paused and leave no evidence in the printed output of such a
1921   pause. This value MUST be supported, if the Pause-Printer operation is supported.

1922   **'shutdown'**: Someone has removed a Printer object from service, and the device may be powered down or
1923   physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the
1924   Printer object is realized by a print server that is still active, the Printer object MUST perform no other
1925   operations requested by a client, including returning this value. If a Printer object had been printing a
1926   job when it was shutdown, the Printer NEED NOT resume printing that job when the Printer is no
1927   longer shutdown. If the Printer resumes printing such a job, it may leave evidence in the printed

1928   output of such a shutdown, e.g. the part printed before the shutdown may be printed a second time
1929   after the shutdown.

1930   **'spool-area-full'**: The limit of persistent storage allocated for spooling has been reached. The Printer is
1931   temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept
1932   more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small
1933   number jobs at a time or a spooling Printer that has filled the spool space.

1934   **'stopped-partly'**: When a Printer object controls more than one output device, this reason indicates that one
1935   or more output devices are stopped. If the reason is a report, fewer than half of the output devices
1936   are stopped. If the reason is a warning, fewer than all of the output devices are stopped.

1937   **'stopping'**: The Printer object is in the process of stopping the device and will be stopped in a while. When
1938   the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The
1939   'stopping-warning' reason is never an error, even for a Printer with a single output device. When an
1940   output-device ceases accepting jobs, the Printer will have this reason while the output device
1941   completes printing.

1942   **'timed-out'**: The server was able to connect to the output device (or is always connected), but was unable to
1943   get a response from the output device.

1944   **'toner-empty'**: The device is out of toner.

1945   **'toner-low'**: The device is low on toner.

1946   10 New Values for Existing Printer Description Attributes

1947   This section contains those attributes for which additional values are added.

1948   10.1 operations-supported (1setOf type2 enum)

1949   The following "operation-id" values are added in order to support the new operations defined in this document:

1950   **Table 13 – Operation-id assignments**

Value	Operation Name	Reference
0x0032	Cancel-Current-Document	[this-spec] §3.10
0x0033	Cancel-Document	[this-spec] §3.9
0x0034	Get-Document-Attributes	[this-spec] §3.5
0x0035	Get-Documents	[this-spec] §3.7
0x0036	Delete-Document	[this-spec] §3.11
0x0037	Set-Document-Attributes	[this-spec] §3.8
0x0038	Validate-Document	[this-spec] §3.5
0x0039	Create-Document	[this-spec] §3.1
0x003A	Send-Data	[this-spec] §3.2

1951   11 Conformance Requirements

1952   This section specifies the conformance requirements for Printers and clients.

1953   11.1 Printer conformance requirements

1954   In order to conform to this specification, a Printer:

1955   1. MUST meet the conformance requirements for Printers specified in [RFC2911].

1956   2. MUST support the Document operations that section 3 REQUIRES a Printer to support.

1957   3. MUST support the operation attributes in the Send-Document operation and, if supported, the Send-URI
1958   operation that section 6 REQUIRES a Printer to support.

1959   4. MAY support any of the Document Template attributes in Document Creation operations as indicated in
1960   section 7 and MUST NOT support them for contexts for where they are not defined as indicated in the Table
1961   9 with an "n".

1962   5. MUST support the Document Description attributes that section 8 REQUIRES a Printer to support.

1963   6. MUST support the Printer attributes that section 8.11 REQUIRES a Printer to support.

1964   7. MUST support the values of Printer Descriptions attribute that section 10 REQUIRES a Printer to support.

1965 11.2 Client conformance requirements

1966   In order to conform to this specification, a client:

1967   1. MUST meet the conformance requirements for clients specified in [RFC2911]

1968   2. MAY support any of the Document operations defined in section 3.

1969   3. MUST supply the operation attributes that section 6 REQUIRES a client to supply in operation requests.

1970   4. MUST supply any Document Template attributes in the format that section 7 REQUIRES a client to supply in
1971   Document Creation operations and MUST NOT support them for contexts for where they are not defined as
1972   indicated in the Table 9 with an "n".

1973   5. SHOULD support any of the Document Description attributes that section 8 REQUIRES a Printer to support.

1974   6. MAY support any of the Printer attributes listed in section 8.11.

1975   7. MAY support any of the values of the Printer Descriptions attributes in section 10.

1976 12 Normative References

1977   Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
1978   below, rather than the RFC number (except for [RFC2910] and [RFC2911]). IETF RFCs and IANA registrations
1979   require using the RFC numbers in the body of the document for references.

1980   [adm-ops]
1981   Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol (IPP): Job and Printer Administrative
1982   Operations", <draft-ietf-ipp-ops-set2-03.txt>, July 17, 2001.

1983   [coll]
1984   deBry, R., Hastings, T., Herriot, R., Ocke, K., and P. Zehler, "Internet Printing Protocol (IPP): The 'collection'
1985   attribute syntax", <draft-ietf-ipp-collection-05.txt>, work in progress, July 17, 2001.

1986   [finish]
1987   Hastings, T., Fullman, D., "Internet Printing Protocol (IPP): "finishings" attribute values extension", IEEE-
1988   ISTO 5100.1-2001, February 5, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.1.pdf

1989   [get-method]
1990   Herriot, R., and T. Hastings, "Internet Printing Protocol (IPP): The 'ippget' Delivery Method for Event
1991   Notifications", <draft-ietf-ipp-notify-get-08.txt>, September 5, 2002.

1992   [job-prog]
1993   Hastings, T., Lewis, H., and R. Bergman, "Internet Printing Protocol (IPP): Job Progress Attributes",
1994   RFC3381, September 2002.

1995   [not-srv]
1996   Hastings, T., Lewis, H, and Ira McDonald, "Distributed Notification Server", September 26, 2002, work in
1997   progress to become IEEE-ISTO 5100.6-2002, ftp://ftp.pwg/org/pub/pwg/ipp/new_NOT/ipp-dist-not-service-
1998   020926.doc

1999   [ntfy]
2000   Herriot, R., Hastings, T., Shepherd, M., deBry, R., Isaacson, S., Martin, J., and R. Bergman, "Internet
2001   Printing Protocol/1.1: Event Notifications and Subscriptions", <draft-ietf-ipp-not-spec-08.txt>, November 19,
2002   2001.

2003   [output-bin]
2004   Hastings, T., and R. Bergman, "Internet Printing Protocol (IPP): output-bin attribute extension", IEEE-ISTO
2005   5100.2-2001, February 7, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf.

2006   [override]
2007   Herriot, R., Ocke, K., "Internet Printing Protocol (IPP): Override Attributes for Documents and Pages", IEEE-
2008   ISTO 5100.4-2001, February 7, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf.

2009   [prod-print]
2010   Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO
2011   5100.3-2001, February 12, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf.

2012   [prod-print2] Hastings, T., and D. Fullman, "Internet Printing Protocol (IPP): Production Printing Attributes - Set 2", to
2013   become a PWG IEEE-ISTO standard, work in progress, August 21, 2002,
2014   ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp-prod-print-set2-draft-v0_1-020821.pdf.

2015   [RFC2911]
2016   R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.1: Model and
2017   Semantics", RFC 2911, September 2000.

2018   [set-ops]
2019   Hastings, T., Herriot, R., Kugler, C., and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set
2020   Operations", RFC 3380, September 2002.

2021 # 13 Informative References

2022 [fsg-jt]
2023 Free Software Group, Open Printing Job Ticket API, Visit: http://www.freestandards.org/openprinting/

2024 [pwg-psi]
2025 "Print Service Interface (PSI)", work in progress to become a PWG IEEE-ISTO standard. Visit
2026 http://www.pwg.org/.

2027 [pwg-sm]
2028 Zehler, P., and S. Albright, "PWG Semantic Model", work in progress to become a PWG IEEE-ISTO
2029 standard, version 0.11, September 27, 2002. ftp://ftp.pwg.org/pub/pwg/Semantic-Model/PWG-Semantic-
2030 Model.pdf

2031 [RFC2565]
2032 Herriot, R., Butler, S., Moore, P., and R. Turner, "Internet Printing Protocol/1.0: Encoding and Transport",
2033 RFC 2565, April 1999.

2034 [RFC2566]
2035 R. deBry, T. Hastings, R. Herriot, S. Isaacson, and P. Powell, "Internet Printing Protocol/1.0: Model and
2036 Semantics", RFC 2566, April 1999.

2037 [RFC2567]
2038 Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.

2039 [RFC2568]
2040 Zilles, S., "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol", RFC 2568,
2041 April 1999.

2042 [RFC2569]
2043 Herriot, R., Hastings, T., Jacobs, N., Martin, J., "Mapping between LPD and IPP Protocols", RFC 2569, April
2044 1999.

2045 [RFC2616]
2046 R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, "Hypertext Transfer
2047 Protocol - HTTP/1.1", RFC 2616, June 1999.

2048 [RFC3196]
2049 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1: Implementer's
2050 Guide", RFC 3196, November 2001.

2051 [RFC3239]
2052 Kugler, C., Lewis, H. and T. Hastings, "Internet Printing Protocol (IPP): Requirements for Job, Printer, and
2053 Device Administrative Operations", RFC 3239, February 2002.

14 IANA Considerations

This section contains the registration information for IANA to add to the various IPP Registries according to the procedures defined in RFC 2911 [RFC2911] section 6 to cover the definitions in this document. The resulting registrations will be published in the http://www.iana.org/assignments/ipp-registrations registry.

> *Note to the RFC Editor: Replace the References below with the RFC number for the appropriate document,*
> *so that it accurately reflects the content of the information for the IANA Registry.*

14.1 Attribute Registrations

The following table lists all the attributes defined in this document. These are to be registered according to the procedures in RFC 2911 [RFC2911] section 6.2.

```
Attribute Name (attribute syntax):             Reference:   Section:
Document Description attributes:               Reference:   Section:
attributes-charset (charset)                   [RFC2911]    4.3.19
attributes-natural-language (naturalLanguage)  [RFC2911]    4.3.20
compression (type3 keyword)                    [RFC2911]    3.2.1.1
current-page-order (type2 keyword)             [prod-print] 4.1
date-time-at-completed (dateTime)              [RFC2911]    4.3.14.7
date-time-at-creation (dateTime)               [RFC2911]    4.3.14.5
date-time-at-processing (dateTime)             [RFC2911]    4.3.14.6
detailed-status-message (1setOf text (MAX))    [RFC2911]    4.3.10
document-access-errors (1setOf text(MAX))      [RFC2911]    4.3.11
document-format (documentFormat)               [RFC2911]    3.2.1.1
document-id-uri (uri)                          [this spec]  8.2
document-message (text(127))                   [this spec]  8.10
document-name (name(MAX))                      [RFC2911]    3.2.1.1
document-natural-language (naturalLanguage)    [RFC2911]    3.2.1.1
document-number (integer(0:MAX))               [this spec]  8.1
document-state (type1 enum)                    [this spec]  8.5
document-state-message (text(MAX))             [this spec]  8.10
document-state-reasons (1setOf type2 keyword)  [this spec]  8.7
document-uri (uri)                             [this spec]  8.3
impressions  (integer(0:MAX))                  [RFC2911]    4.3.17.2
impressions-completed (integer(0:MAX))         [RFC2911]    4.3.18.2
impressions-completed-current-copy             [job-prog]   4.4
      (integer(0:MAX))
k-octets  (integer(0:MAX))                     [RFC2911]    4.3.17.1
k-octets-processed (integer(0:MAX))            [RFC2911]    4.3.18.1
last-document  (boolean)                       [RFC2911]    4.3.12
media-sheets  (integer(0:MAX))                 [RFC2911]    4.3.17.3
media-sheets-completed (integer(0:MAX))        [RFC2911]    4.3.18.3
more-info (uri)                                [RFC2911]    4.3.4
printer-up-time (integer (1:MAX))              [RFC2911]    4.3.14.4
sheet-completed-copy-number (integer(0:MAX))   [job-prog]   4.2
```

```
2097  time-at-completed (integer (MIN:MAX))              [RFC2911]    4.3.14.3
2098  time-at-creation (integer (MIN:MAX))               [RFC2911]    4.3.14.1
2099  time-at-processing (integer (MIN:MAX))             [RFC2911]    4.3.14.2
2100  warnings-count (integer(0:MAX))                    [override]   6.1
2101
2102
2103  Document Templates attributes:                     Reference:   Section:
2104  copies (integer(1:MAX))                            [RFC2911]    4.2.5
2105  cover-back (collection)                            [prod-print] 3.1
2106  media (type3 keyword | name(MAX))                  [prod-print] 3.1.1
2107  media-col (collection)                             [prod-print] 3.1.1
2108    cover-front (collection)                         [prod-print] 3.1
2109    cover-type (type2 keyword)                       [prod-print] 3.1.2
2110    media (type3 keyword | name(MAX))                [prod-print] 3.1.1
2111    media-col (collection)                           [prod-print] 3.1.1
2112  cover-type (type2 keyword)                         [prod-print] 3.1.2
2113  finishings (1setOf type2 enum)                     [RFC2911]    4.2.6
2114                                                     [finish]     2
2115  finishings-col (collection)                        [prod-print] 3.2
2116    finishing-template (name(MAX))                   [prod-print] 3.2.1
2117    stitching (collection)                           [prod-print] 3.2.2
2118      stitching-locations (1setOf integer(0:MAX))    [prod-print] 3.2.2.3
2119      stitching-offset (integer (0:MAX))             [prod-print] 3.2.2.2
2120      stitching-reference-edge (type2 keyword)       [prod-print] 3.2.2.1
2121  force-front-side (1setOf integer(1:MAX))           [prod-print] 3.3
2122  imposition-template (type2 keyword | name(MAX))    [prod-print] 3.4
2123  insert-sheet (1setOf collection)                   [prod-print] 3.5
2124    insert-after-page-number (integer(0:MAX))        [prod-print] 3.5.1
2125    insert-count (integer(0:MAX))                    [prod-print] 3.5.2
2126    media (type3 keyword | name(MAX))                [prod-print] 3.5.3
2127    media-col (collection)                           [prod-print] 3.5.3
2128  media (type3 keyword | name(MAX))                  [RFC2911]    4.2.11
2129  media-col (collection)                             [prod-print] 3.13
2130    media-back-coating (type3 keyword |              [prod-print] 3.13.10
2131       name(MAX))
2132    media-color (type3 keyword | name(MAX))          [prod-print] 3.13.4
2133    media-front-coating (type3 keyword |             [prod-print] 3.13.10
2134       name(MAX))
2135    media-hole-count (integer(0:MAX))                [prod-print] 3.13.6
2136    media-info (text(255))                           [prod-print] 3.13.3
2137    media-key (type3 keyword | name(MAX))            [prod-print] 3.13.1
2138    media-order-count (integer(1:MAX))               [prod-print] 3.13.7
2139    media-preprinted (type3 keyword | name(MAX))     [prod-print] 3.13.5
2140    media-recycled (type3 keyword | name(MAX))       [prod-print] 3.13.11
2141    media-size (collection)                          [prod-print] 3.13.8
2142      x-dimension (integer(0:MAX))                   [prod-print] 3.13.8.1
```

```
2143        y-dimension (integer(0:MAX))                    [prod-print] 3.13.8.2
2144      media-type (type3 keyword | name(MAX)             [prod-print] 3.13.2
2145      media-weight-metric (integer(0:MAX))             [prod-print] 3.13.9
2146    media-input-tray-check (type3 keyword |            [prod-print] 3.14
2147        name(MAX))
2148    number-up (integer(1:MAX))                         [RFC2911]    4.2.9
2149    orientation-requested (type2 enum)                 [RFC2911]    4.2.10
2150    output-bin (type2 keyword | name(MAX))             [output-bin] 2.1
2151    page-delivery (type2 keyword)                      [prod-print] 3.15
2152    page-order-received (type2 keyword)                [prod-print] 3.16
2153    page-overrides (1setOf collection)                 [override]   5.2
2154      document-copies (1setOf rangeOfInteger(MAX))     [override]   5.2.3
2155      input-documents (1setOf rangeOfInteger(MAX))     [override]   5.2.1
2156      output-documents (1setOf rangeOfInteger(MAX))    [override]   5.2.2
2157      pages (1setOf rangeOfInteger(MAX))               [override]   5.2.4
2158      <any other Job Template attributes that
2159    affect pages, such as media or media-col (
2160    page-ranges (1setOf rangeOfInteger(1:MAX))         [RFC2911]    4.2.7
2161    pages-per-subset (1setOf integer(1:MAX))           [prod-print] 5.3
2162    presentation-direction-number-up (type2           [prod-print] 3.17
2163    keyword)
2164    print-quality (type2 enum)                         [RFC2911]    4.2.13
2165    printer-resolution (resolution)                    [RFC2911]    4.2.12
2166    separator-sheets (collection)                      [prod-print] 3.18
2167      media (type3 keyword | name(MAX))                [prod-print] 3.18.2
2168      media-col (collection)                           [prod-print] 3.18.2
2169      separator-sheets-type (type3 keyword |           [prod-print] 3.18.1
2170        name(MAX))
2171    sheet-collate (type2 keyword)                      [job-prog]   3.1
2172    sides (type2 keyword)                              [RFC2911]    4.2.8
2173    x-image-position (type2 keyword)                   [prod-print] 3.19.2
2174    x-image-shift (integer(MIN:MAX))                   [prod-print] 3.19.3
2175    x-side1-image-shift (integer(MIN:MAX))             [prod-print] 3.19.4
2176    x-side2-image-shift (integer(MIN:MAX))             [prod-print] 3.19.5
2177    y-image-position (type2 keyword)                   [prod-print] 3.19.6
2178    y-image-shift (integer(MIN:MAX))                   [prod-print] 3.19.7
2179    y-side1-image-shift (integer(MIN:MAX))             [prod-print] 3.19.8
2180    y-side2-image-shift (integer(MIN:MAX))             [prod-print] 3.19.9
2181
2182    Job Template attributes:                           Reference:   Section:
2183    job-copies (integer(1:MAX))                        [this spec]  7.1.1
2184    job-cover-back (collection)                        [this spec]  7.1.2
2185      <member attributes are the same as "cover-back">
2186    job-cover-front (collection)                       [this spec]  7.1.3
2187      <member attributes are the same as "cover-front">
2188    job-finishings (1setOf type2 enum)                 [this spec]  7.1.4
```

```
2189  job-finishings-col (1setOf collection)           [this spec] 7.1.5
2190    <member attributes are the same as "finishings-col">
2191
2192  Printer Descriptions:                            Reference:  Section:
2193  document-creation-attributes-supported (1setOf type2 keyword)
2194                                                   [this spec] 9.1
2195
2196  Operation attributes:                            Reference:  Section:
2197  document-mandatory-attributes (1setOf type2 keyword)
2198                                                   [this spec]  6.2.3
2199  document-message (text(127))                     [this spec]  3.9.1.1
2200  input-document-number (integer(1:MAX))           [this spec]  3.1.1.1
2201  job-mandatory-attributes (1setOf type2 keyword) [this spec]  6.2.2
2202  last-document (boolean)                          [this spec]  3.1.1.2
2203
```

2204 14.2 Additional Enum Attribute Value Registrations

2205 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
2206 These are to be registered according to the procedures in RFC 2911 [RFC2911] section 6.1.
2207

```
2208    Value       Name                            Reference   Section:
2209    --------    ----------------------          ---------   -------
2210  document-state (type1 enum)                     [this spec]   §8.5
2211    3   pending                                   [this spec]   §8.5
2212    5   processing                                [this spec]   §8.5
2213    7   canceled                                  [this spec]   §8.5
2214    8   aborted                                   [this spec]   §8.5
2215    9   completed                                 [this spec]   §8.5
2216
2217  job-finishings (1setOf type2 enum)              [this spec]   §7.1.4
2218    <enum values are the same as "finishings">
2219
2220  operations-supported (type2 enum):
2221    0x0032      Cancel-Current-Document           [this-spec]   §3.10
2222    0x0033      Cancel-Document                   [this-spec]   §3.9
2223    0x0034      Get-Document-Attributes           [this-spec]   §3.5
2224    0x0035      Get-Documents                     [this-spec]   §3.7
2225    0x0036      Delete-Document                   [this-spec]   §3.11
2226    0x0037      Set-Document-Attributes           [this-spec]   §3.8
2227    0x0038      Validate-Document                 [this-spec]   §3.5
2228    0x0039      Create-Document                   [this-spec]   §3.1
2229    0x003A      Send-Data                         [this-spec]   §3.2
```

2230 14.3 Operation Registrations

2231 The following table lists all of the operations defined in this document. These are to be registered according to the
2232 procedures in RFC 2911 [RFC2911] section 6.4.

```
2233
2234    Operations:                              Reference:    Section:
2235    Cancel-Current-Document                  [this-spec]   §3.10
2236    Cancel-Document                          [this-spec]   §3.9
2237    Get-Document-Attributes                  [this-spec]   §3.5
2238    Get-Documents                            [this-spec]   §3.7
2239    Delete-Document                          [this-spec]   §3.11
2240    Set-Document-Attributes                  [this-spec]   §3.8
2241    Validate-Document                        [this-spec]   §3.5
2242    Create-Document                          [this-spec]   §3.1
2243    Send-Data                                [this-spec]   §3.2
2244
```

2245 # 15 Internationalization Considerations

2246 The internationalization considerations for this extension for handling the Document object are the same as for
2247 handling the Job object in [RFC2911].

2248 # 16 Security Considerations

2249 The Document object should provide no more increased security considerations than the Job object. The Printer
2250 MUST provide the same access control for Document objects as for Job objects.

2251 # 17 Contributors

2252 # 18 Acknowledgments

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20 Appendix A: Document operations compared to Job operations

2278   This appendix compares the Document operations with the existing Job operations to show the parallelism.

2279   Table 14 compares the Job and Document operations. The two Conf. columns indicate the conformance
2280   requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
2281   in the Document Conformance column means if the Document object is supported. Whether a Document operation
2282   is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
2283   of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
2284   based protocols, APIs, and implementations.

2285   **Table 14 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
Cancel-Current-Job	OPT	**Cancel-Current-Document**	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[48]
Print-URI	OPT	**Send-URI** (existing operation - see [RFC2911] with an additional Document attributes group defined in section 3.4)	OPT
N/A		**Send-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	**Validate-Document**	REQ

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[48] 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.

2288 # 21 Annex B: Change Log (informative)

2289 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:
2290   1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved
2291   by the PWG Last Call to progress as a Draft Standard.
2292   2. Changed Cancel-Document from OPTIONAL to REQUIRED.
2293   3. Added Table 3 and Table 4 to show the request and response signatures of the Document Creation and
2294   Validation operations.
2295   4. Renamed the "document-number" operation attribute to "input-document-number", to agree with [override]
2296   and because the Document object is really the Input Document (as opposed to the Output Document). The
2297   Printer copies this value to the Document's "document-number" Document Description attribute.
2298   5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
2299   6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
2300   7. Added "document-message" (text(127)) operation attribute to the Document Creation requests to go with the
2301   "document-message" agreement (see point #15).
2302   8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes
2303   in Group 4.
2304   9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
2305   attribute in a Document Creation response.
2306   10. Added the "document-mandatory-attributes" operation attribute.
2307   11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
2308   Attributes and the other Document attributes.
2309   12. Allowed the client to supply or omit the "document-uri" operation attribute in a Validate-Job request.
2310   13. Clarified that the "document-number" operation attribute MUST follow the Printer and Job Target in Group 1.
2311   14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
2312   and "document-id-uri" to be parallel with the Get-Jobs operation.
2313   15. Changed the "message" operation attribute in Cancel-Document and Cancel-Current-Document to
2314   "document-message" operation attribute which the Printer copies to the "document-message" Document
2315   Description attribute for use both by the user and the operator.
2316   16. Clarified that the "document-state-reasons" values never affect Job scheduling.
2317   17. Made Job Level - page override programming higher precedence than Document level Document object
2318   attributes.
2319   18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
2320   requested".
2321   19. In Table 6, flagged the operation attributes that the Printer copies to the corresponding Job and Document
2322   Description attributes in Document Creations operations.
2323   20. Fixed "job-mandatory-attributes" operation attribute so its only supplied at Job level, now that we have
2324   "document-mandatory-attributes" operation attribute.
2325   21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
2326   with "job-mandatory-attributes" and "document-mandatory-attributes" operation attributes.
2327   22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages
2328   across Input-Documents.
2329   23. Disallowed "page-ranges" at the Page Level.
2330   24. Disallowed "pages-per-subset" at the Document level (and Page Level).
2331   25. Disallowed "separator-sheets" at the Page Level.
2332   26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-
2333   Attributes responses that the Printer MUST support, just like "job-printer-up-time" operation attribute for Get-
2334   Jobs and Get-Job-Attributes.
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2336 Version 0.4, 14 October 2002:
2337   1. Added the operation specifications.
2338   2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
2339   3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
2340   4. Added the Attribute Precedence section 5.
2341   5. Added [prod-print2] attributes.

2342	6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
2343	document-id-uri, and redirect-uri.
2344	
2345	Version 0.3, 9 September 2002:
2346	1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
2347	2. Added "original-requesting-user-name" Operation attribute to Table 6.
2348	3. Added "y" to "output-bin" in Table 8 so it MAY be a Document Template attribute.
2349	4. Clarified the * and ** in Table 9 - Job and Document Description attributes.
2350	5. Added section 8.11 all of the Printer attributes defined In any IPP standard.
2351	6. Allocated operation-id enums in section 10 to the 7 Document operations.
2352	7. Added the conformance section 11
2353	8. Completed the IANA Considerations section 14.
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