

Working Draft, May 9, 2003

2 ISSUES are highlighted like this.

Maturity Level: Development

Important information to review is highlighted like this.

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

**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 that are passive objects operated on by the Job. Multi-Document Jobs exist in IPP [rfc2911] but are not objects in their own right. This specification elevates the Document to an IPP object thus giving access to a document's metadata within a Job. A Document object allows production instructions (i.e. template attributes in IPP) to be applied at both the Job and Document level. This enables document overrides of Job wide production instructions.

This specification defines or extends RFC2911 operations as follows:

- 2 existing rfc2911 operations that create a Job and Document or just a Job: PrintJob, CreateJob
- 2 extended rfc2911 operations that create Documents: Send-URI Send-Document
- 7 new operations: Create-Document, Send-Data, Get-Documents, Cancel-Document, Get-Document-Attributes, Delete-Document, Set-Document-Attributes

This specification defines some new Operation attributes that describe the contents of the Document and permit the Printer to reject requests that it cannot process correctly. The Printer copies these Operation attributes to the corresponding Document Description attributes, which clients may query.

This specification also defines most Job Template attributes as Document Template attributes ("xxx" Document attribute, "xxx-actual" Document Description, "xxx-default" Printer attribute, and "xxx-supported" Printer attribute. In addition this specification 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 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.



Working Draft, May 9, 2003

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

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

[ftp://ftp.pwg.org/pub/pwg/ipp/new\\_DOC/wd-ippdoc20030506.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc20030506.pdf), .doc, .rtf

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

48 **Copyright (C) 2003, IEEE ISTO. All rights reserved.**

49 This document may be copied and furnished to others, and derivative works that comment on, or otherwise explain it  
50 or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without  
51 restriction of any kind, provided that the above copyright notice, this paragraph and the title of the Document as  
52 referenced below are included on all such copies and derivative works. However, this document itself may not be  
53 modified in any way, such as by removing the copyright notice or references to the IEEE-ISTO and the Printer  
54 Working Group, a program of the IEEE-ISTO.

55 Title: The Printer Working Group Standard for the Internet Printing Protocol (IPP): Document Object

56 The IEEE-ISTO and the Printer Working Group DISCLAIM ANY AND ALL WARRANTIES, WHETHER EXPRESS  
57 OR IMPLIED INCLUDING (WITHOUT LIMITATION) ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR  
58 FITNESS FOR A PARTICULAR PURPOSE.

59 The Printer Working Group, a program of the IEEE-ISTO, reserves the right to make changes to the document  
60 without further notice. The document may be updated, replaced or made obsolete by other documents at any time.

61 The IEEE-ISTO takes no position regarding the validity or scope of any intellectual property or other rights that might  
62 be claimed to pertain to the implementation or use of the technology described in this document or the extent to  
63 which any license under such rights might or might not be available; neither does it represent that it has made any  
64 effort to identify any such rights.

65 The IEEE-ISTO invites any interested party to bring to its attention any copyrights, patents, or patent applications, or  
66 other proprietary rights which may cover technology that may be required to implement the contents of this  
67 document. The IEEE-ISTO and its programs shall not be responsible for identifying patents for which a license may  
68 be required by a document and/or IEEE-ISTO Industry Group Standard or for conducting inquiries into the legal  
69 validity or scope of those patents that are brought to its attention. Inquiries may be submitted to the IEEE-ISTO by e-  
70 mail at:

71 [ieee-isto@ieee.org](mailto:ieee-isto@ieee.org).

72 The Printer Working Group acknowledges that the IEEE-ISTO (acting itself or through its designees) is, and shall at  
73 all times, be the sole entity that may authorize the use of certification marks, trademarks, or other special  
74 designations to indicate compliance with these materials.

75 Use of this document is wholly voluntary. The existence of this document does not imply that there are no other  
76 ways to produce, test, measure, purchase, market, or provide other goods and services related to its scope.

77

## About the IEEE-ISTO

The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities that support the implementation and acceptance of standards in the marketplace. The organization is affiliated with the IEEE (<http://www.ieee.org/>) and the IEEE Standards Association (<http://standards.ieee.org/>).

For additional information regarding the IEEE-ISTO and its industry programs visit <http://www.ieee-isto.org>.

## About the IEEE-ISTO PWG

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

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

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

## Contact information:

IPP Web Page: <http://www.pwg.org/ipp/>  
IPP Mailing List: [ipp@pwg.org](mailto:ipp@pwg.org)

To subscribe to the ipp mailing list, send the following email:

- 1) send it to [majordomo@pwg.org](mailto:majordomo@pwg.org)
- 2) leave the subject line blank
- 3) put the following two lines in the message body:  
subscribe ipp  
end

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

# Contents

117		
118	1	Introduction and Summary 9
119	1.1	Scope ..... 9
120	2	Terminology 11
121	2.1	Conformance Terminology..... 11
122	2.2	Other Terminology ..... 11
123	3	New Job operations and semantic extensions to Job operations 13
124	3.1	Job Creation operations..... 14
125	3.1.1	ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)..... 14
126	3.1.2	Create-Job ([rfc2911] section 3.2.4)..... 14
127	3.1.3	Print-Job ([rfc2911] section 3.2.1) ..... 15
128	3.1.4	Print-URI ([rfc2911] section 3.2.2)..... 15
129	3.2	Get-Jobs ([rfc2911] section 3.2.6)..... 15
130	3.2.1	"limit" (integer(1:MAX)): ..... 15
131	3.3	Get-Documents Operation ..... 16
132	3.3.1	Get-Documents Request ..... 16
133	3.3.1.1	"limit" (integer(1:MAX)): ..... 16
134	3.3.1.2	"requested-attributes" (1setOf type2 keyword): ..... 16
135	3.3.2	Get-Documents Response ..... 17
136	3.4	Cancel-Job ([rfc2911] section 3.3.3) ..... 17
137	3.5	Send-Document ([rfc2911] section 3.3.1) ..... 18
138	3.6	Send-URI ([rfc2911] section 3.3.2) ..... 18
139	3.7	Hold-Job ([rfc2911] section 3.3.5)..... 18
140	3.8	Release-Job ([rfc2911] section 3.3.6)..... 18
141	3.9	Restart-Job ([rfc2911] section 3.3.7)..... 18
142	3.10	Reprocess-Job ([adm-ops] section 4.1)..... 18
143	4	Document Operations 18
144	4.1	Create-Document..... 19
145	4.1.1	Create-Document Request..... 20
146	4.1.1.1	last-document (boolean) ..... 20
147	4.1.1.2	document-message (text(MAX)) ..... 20
148	4.1.1.3	Additional Operation attributes: ..... 21
149	4.1.1.4	Ignoring unsupported or improper Operation attributes: ..... 21
150	4.1.2	Create-Document Response ..... 22
151	4.1.2.1	document-number (integer(1:MAX)) ..... 23
152	4.1.2.2	document-state (type1 enum) ..... 23
153	4.1.2.3	document-state-reasons (1setOf type2 keyword) ..... 23
154	4.1.2.4	document-state-message (text(MAX)) ..... 23
155	4.2	Send-Data ..... 23
156	4.2.1	Send-Data request ..... 24
157	4.2.2	Send-Data Response ..... 24
158	4.3	Send-Document ..... 25
159	4.3.1	Send-Document Request ..... 25

160	4.3.2 Send-Document Response .....	25
161	4.4 Send-URI .....	26
162	4.5 Get-Document-Attributes .....	26
163	4.5.1 Get-Document-Attributes Request .....	27
164	4.5.1.1 "requested-attributes" (1setOf keyword): .....	28
165	4.5.2 Get-Document-Attributes Response .....	28
166	4.6 Set-Document-Attributes.....	28
167	4.6.1 Settable and READ-ONLY Document Description attributes.....	30
168	4.6.2 Set-Document-Attributes Request.....	30
169	4.6.3 Set-Document-Attributes Response.....	31
170	4.7 Cancel-Document .....	32
171	4.7.1 Cancel-Document Request .....	33
172	4.7.1.1 document-message (text(MAX)) Operation attribute .....	33
173	4.7.2 Cancel-Document Response.....	34
174	5 Administrative Job and Document operations .....	34
175	5.1 Purge-Jobs ([rfc2911] section 3.2.9).....	34
176	5.2 Cancel-Current-Job ([adm-ops] section 4.2).....	34
177	5.3 Suspend-Current-Job ([adm-ops] section 4.3.1).....	34
178	5.4 Delete-Document .....	35
179	6 Job and Document Template Attribute Precedence during Job processing .....	35
180	7 Operation Attributes for the Job and Document Creation operations .....	37
181	7.1 Operation Attributes <i>supplied</i> at the Job and Document Levels for Creation.....	37
182	7.2 Operation/Document Description attributes.....	41
183	7.2.1 compression (type2 keyword).....	41
184	7.2.2 document-format (mimeMediaType) .....	41
185	7.2.3 document-natural-language (naturalLanguage) .....	42
186	7.3 Override Operation attributes in Send-Document and Send-URI.....	43
187	7.4 Operation Attributes <i>returned</i> in Job and Document Creation responses .....	43
188	8 Job Template and Document Template attributes .....	44
189	8.1 Document Template attributes .....	51
190	9 Job Description and Document Description attributes .....	51
191	9.1 Job Description attributes.....	56
192	9.1.1 ipp-attribute-fidelity (boolean) .....	56
193	9.2 Document Description attributes.....	56
194	9.2.1 attributes-charset (charset).....	57
195	9.2.2 attributes-natural-language (naturalLanguage) .....	57
196	9.2.3 compression (type3 keyword).....	57
197	9.2.4 current-page-order (type2 keyword) .....	57
198	9.2.5 date-time-at-completed (dateTime) .....	57
199	9.2.6 date-time-at-creation (dateTime) .....	57
200	9.2.7 date-time-at-processing (dateTime) .....	57
201	9.2.8 document-format (mimeMediaType) .....	57
202	9.2.9 document-job-id (integer(1:MAX)) .....	58
203	9.2.10 document-job-uri (uri) .....	58
204	9.2.11 document-message (text(MAX)).....	58

205	9.2.12 document-name (name(MAX)) .....	58
206	9.2.13 document-natural-language (naturalLanguage) .....	58
207	9.2.14 document-number (integer(1:MAX)) .....	58
208	9.2.15 document-printer-uri (uri) .....	58
209	9.2.16 document-state (type1 enum) and job-state (type1 enum) .....	59
210	9.2.16.1 The "job-state" Job Description attribute and the Job Life Cycle .....	61
211	9.2.16.2 The "document-state" Document Description attribute and the Document object life Cycle .....	61
212	9.2.16.3 Forwarding Servers .....	62
213	9.2.16.4 Partitioning of Job/Document States .....	62
214	9.2.17 document-state-message (text(MAX)) and job-state-message (text(MAX)) .....	63
215	9.2.18 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2 keyword) .....	63
216	9.2.19 document-uri (uri) .....	69
217	9.2.20 impressions-completed-current-copy (integer(0:MAX)) .....	69
218	9.2.21 [job-]detailed-status-message (1setOf text(MAX)) .....	69
219	9.2.22 [job-]document-access-errors (1setOf text(MAX)) .....	69
220	9.2.23 [job-]impressions (integer(0:MAX)) .....	69
221	9.2.24 [job-]impressions-completed (integer(0:MAX)) .....	69
222	9.2.25 [job-]k-octets (integer(0:MAX)) .....	70
223	9.2.26 [job-]k-octets-processed (integer(0:MAX)) .....	70
224	9.2.27 [job-]media-sheets (integer(0:MAX)) .....	70
225	9.2.28 [job-]media-sheets-completed (integer(0:MAX)) .....	70
226	9.2.29 [job-]more-info (uri) .....	70
227	9.2.30 [job-]printer-up-time (integer (1:MAX)) .....	70
228	9.2.31 last-document (boolean) .....	70
229	9.2.32 output-device-assigned (name(127)) .....	70
230	9.2.33 sheet-completed-copy-number (integer(0:MAX)) .....	71
231	9.2.34 time-at-completed (integer (MIN:MAX)) .....	71
232	9.2.35 time-at-creation (integer (MIN:MAX)) .....	71
233	9.2.36 time-at-processing (integer (MIN:MAX)) .....	71
234	10 Printer attributes .....	71
235	10.1 attributes-charset-supported (1setOf charset) .....	78
236	10.2 attributes-natural-language-supported (1setOf naturalLanguage) .....	78
237	10.3 document-creation-attributes-supported (1setOf type2 keyword) .....	78
238	10.4 printer-state-reasons (1setOf type2 keyword) .....	78
239	11 New Values for Existing Printer Description Attributes .....	82
240	11.1 operations-supported (1setOf type2 enum) .....	82
241	12 Encodings of Additional Attribute Tags .....	82
242	13 Conformance Requirements .....	82
243	13.1 Printer conformance requirements .....	83
244	13.2 Client conformance requirements .....	83
245	14 Normative References .....	84
246	15 Informative References .....	86
247	16 IANA Considerations .....	87
248	16.1 Attribute Registrations .....	87
249	16.2 Keyword attribute values .....	91
250	16.3 Enum Attribute Values .....	91



251	16.4 Operations.....	91
252	16.5 Attribute Group tags.....	92
253	17 Internationalization Considerations.....	92
254	18 Security Considerations.....	92
255	19 Contributors.....	92
256	20 Acknowledgments.....	92
257	21 Author's Address.....	92
258	22 Appendix A: Document operations compared to Job operations.....	93
259	23 Annex B: Change Log (informative).....	94
260		

## 261 Table of Tables

262	Table 1 - Summary of operations.....	10
263	Table 2 - Summary of New Operation/Description attributes.....	11
264	Table 3 - Job Creation and Document Creation operations.....	13
265	Table 4 - Client-supplied Document Creation and Validation Request Signatures.....	19
266	Table 5 - Printer-returned Document Creation and Validation Response Signatures.....	19
267	Table 6 - Document State Table for the Set-Documents-Attributes operation.....	29
268	Table 7- Operation, Default, and Supported Attributes.....	37
269	Table 8 - Operation Attributes supplied at the Job and Document Levels in Job and Document Creation Requests.....	39
270	Table 9 - Operation attributes <i>returned</i> in Job and Document Creation operation <i>responses</i> .....	43
271	Table 10 - Job Template and Document Template attributes.....	45
272	Table 11 - Job and Document Description attributes.....	52
273	Table 12 - "job-state" and "document-state" attribute values.....	59
274	Figure 1 - The "job-state" Job Description attribute and the Job object life cycle.....	61
275	Figure 2 - The "document-state" Document Description attribute and the Document object life cycle.....	62
276	Table 13 - "job-state-reasons" and "document-state-reasons" attribute values.....	64
277	Table 14 - Printer attributes (Job Template and Printer Description).....	72
278	Table 15 - Values of the "printer-state-reasons" Printer attribute.....	79
279	Table 16 - Operation-id assignments.....	82
280	Table 17 - Document operations compared to Job operations.....	93
281		

## 282 Table of Figures

283	Figure 1 - The "job-state" Job Description attribute and the Job object life cycle.....	61
284	Figure 2 - The "document-state" Document Description attribute and the Document object life cycle.....	62
285		



## 286 1 Introduction and Summary

287 This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object.  
 288 The [rfc2911] Job object is extended to contain one or more Document objects that are passive objects operated on  
 289 by the Job. The Job object is created by the REQUIRED Print-Job or the OPTIONAL Create-Job (see [rfc2911]  
 290 sections 3.2.2 and 3.2.4) operations. The Document object is created by the REQUIRED Print-Job or the  
 291 OPTIONAL Send-Document or the OPTIONAL Send-URI (see [rfc2911] section 3.2.2, 3.3.1 and 3.3.2 respectively)  
 292 operations. This specification also adds a Document Attributes group (and tag) to the Send-Document and Send-  
 293 URI requests. The Document Attributes group contains any Document Template attributes to be applied to this  
 294 Document object being created, overriding any corresponding Job Template attribute supplied at the job level. A  
 295 new OPTIONAL Create-Document operation allows a client to supply the Document Attributes without the data (like  
 296 Create-Job does for a Job object). Then the client sends the data content for that Document object using the new  
 297 OPTIONAL Send-Data operation.

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

- 300 1 REQUIRED Job operation: Get-Documents
- 301 1 REQUIRED Document creation operation: PrintJob [rfc2911]
- 302 2 OPTIONAL Document creation operations: Create-Document, Send-Data
- 303 2 OPTIONAL Document creation operation: Send-URI [rfc2911], Send-Document [rfc2911],
- 304 2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
- 305 2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

306 This specification defines some new Operation attributes that describe the contents of the Document and permit the  
 307 Printer to reject requests that it cannot process correctly. The Printer copies these Operation attributes to the  
 308 corresponding Document Description attributes which client may query.

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

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

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

### 323 1.1 Scope

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

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

327 Template attributes and Document Template attributes simply “Job Processing” and “Document Processing”  
 328 attributes). Note: There are a number of footnotes which relate this IPP specification to the PWG Semantic model  
 329 and other PWG projects, such as the Print Service Interface (PSI) [pwg-psi].

330 The Document object is a passive object<sup>2</sup> and is operated upon by the Job. The client uses the new Create-  
 331 Document operation or either of the existing Send-Document and Send-URI operations to create a Document object.  
 332 In addition there are 8 new operations that affect the Document object after it has been created as summarized in  
 333 Table 1.

334 **Table 1 - Summary of operations**

Operation Name	Printer support	Brief Description
Print-Job [rfc2911]	REQUIRED	Creates a Job as in [rfc2911] which contains a single Document object with pushed data in-line. Some additional Operation attributes are defined in this spec for use.
Print-URI [rfc2911]	OPTIONAL	Creates a Job as in [rfc2911] which contains a single Document object with a reference to the document data. Some additional Operation attributes are defined in this spec for use.
Create-Job [rfc2911]	OPTIONAL	Creates the Job object as defined in [rfc2911] with Job Attributes. Job Template attributes that affect individual documents, such as “media”, are inherited by the Document objects.
Create-Document <sup>3</sup>	OPTIONAL	Creates a Document object with Document attributes, but no data.
Send-Data	OPTIONAL	Sends data to the Document object created by Create-Document.
Send-Document [rfc2911]	OPTIONAL	Creates a Document object with Document attributes and data. Some additional Operation attributes are defined in this spec for use, along with a new Document attributes group to pass Document Template attributes.
Send-URI [rfc2911]	OPTIONAL	Creates a Document object with Document attributes and a URL reference to the data (print-by-reference). Some additional Operation attributes are defined in this spec for use, along with a new Document attributes group to pass Document Template attributes.
Get-Document-Attributes	REQUIRED	Get requested attributes of specified Document in the specified Job.
Get-Documents	REQUIRED	Get requested attributes of all of the Documents in the specified Job.
Set-Document-Attributes	OPTIONAL	Set the supplied Document attributes on the specified Document.
Cancel-Document	REQUIRED	Cancel the specified Document in the specified Job, but don't remove it.
Delete-Document	OPTIONAL	Remove the specified Document object and its data from the Job.

335 This specification defines new Operation attributes that allow the client to provide hints<sup>4</sup> or requirements to the Printer  
 336 about individual Document Object contents at request time as summarized in Table 2. The Printer copies these  
 337 Operation attributes supplied by the client in the request to the corresponding Job or Document Description  
 338 attributes.  
 339

<sup>2</sup> 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.

<sup>3</sup> The Create-Document operation maps to the PWG PSI Send-Document-By-Post operation and the Send-Document-Data maps to the HTTP Post operation. **ISSUE01: What is the correct mapping to PSI?**

<sup>4</sup> A hint is an attribute supplied by the client that the Printer can safely not support and still process the document meaningfully. An attribute like “document-format” or “compression” is not a hint, since the Printer will not be able to interpret the Document object content if the Printer doesn't support the supplied value.

340

Table 2 - Summary of New Operation/Description attributes

Operation attribute	Creation operation	Printer support	Description
ipp-attribute-fidelity (boolean) *	Job	MUST	Allows the client to indicate whether or not the Printer MUST support all Job Template and Document Template attributes.
document-format (mimeType) *	Document	MUST	The document format of the Document Object content
document-natural-language (naturalLanguage) *	Document	MAY	The primary language of the Document Object content.

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

343 **2 Terminology**

344 This section defines terminology used throughout this document.

345 **2.1 Conformance Terminology**

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

352 The term **CONDITIONALLY REQUIRED** means that the Printer **MUST** support the feature, if the specified condition  
353 is true. The term **CMUST** means **MUST** if the specified “condition” is true.

354 **2.2 Other Terminology**

355 This document uses the same terminology as [rfc2911], such as “**client**”, “**Printer**”<sup>5</sup>, “**attribute**”, “**attribute value**”,  
356 “**keyword**”, “**Job Template attribute**”, “**Operation attribute**”, “**operation**”, “**request**”, “**response**”, and “**support**”  
357 with the same meaning. In addition, the following terms are defined for use in this document:

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

<sup>5</sup> [rfc2911] uses the terms “Printer object” and “Printer” interchangeably to mean the same thing. For simplicity, this document uses the term “Printer” exclusively, except for definitions copied directly from [rfc2911]. None the less, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server as in [rfc2911].

361 **Document attribute** - an **Operation attribute** or a **Document Template attribute** that applies to a **Document**  
362 **object** as a whole. For example, “document-format” is an Operation attribute and “media” is a Document Template  
363 attribute.

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

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

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

376 **Document Template attribute** - an attribute that the client supplies in a Create-Document, Send-Document, or  
377 Send-URI operation request in the Document Attributes group. For example, “media”.

378 **Honor** - a Printer is said to **Honor** an attribute supplied by the client, if the Printer **supports** that attribute and the  
379 supplied value and performs the indicated semantics. If the client supplies the “ipp-attribute-fidelity” Operation  
380 attribute, the client is indicating which supplied Job Template and Document Template attributes the Printer **MUST**  
381 **Honor**.

382 **Job Attribute** - an **Operation attribute** or a **Job Template attribute** that applies to the Job (object) as a whole. For  
383 example, “job-name” is an **Operation attribute** and “job-priority” is a **Job Template attribute**.

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

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

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

397 Table 3 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job  
398 Creation operations and Document Creation operations, though they only create single Document jobs. In other  
399 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be  
400 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a

separate Document group in which the client can supply Document attributes. Note also that for the “Level” concept, no operation supplies attributes at more than one level.<sup>6</sup>

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

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

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

This section defines the semantic extensions to Job operations that affect Document objects. Printer and Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object and the Document object has no effect on the semantics of the Printer and Subscription operations. The Job operations that MUST NOT have any effect on the Document object because they are defined to affect the Job object as a whole are: **Get-Job-Attributes**<sup>7</sup> ([rfc2911] section 3.3.4), **Get-Jobs**<sup>8</sup> ([rfc2911] section 3.2.6), **Hold-Job** ([rfc2911] section 3.3.5), **Promote-Job** ([adm-ops] section 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2), **Resume-Job** ([adm-ops] section 4.3.2), **Schedule-Job-After** ([adm-ops] section 4.4.2), **Set-Job-Attributes** ([rfc3380] section 4.2), and **Validate-Job** ([rfc2911] section 3.2.3).

<sup>6</sup> 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 Printer sets are called Job Status and Document Status attributes (instead of Description attributes).

<sup>7</sup> 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.

<sup>8</sup> 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.

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

### 416 3.1 Job Creation operations

417 This section defines the extensions to Job Creation operations.

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

#### 419 3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

420 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1)\_when the  
421 client supplies unsupported Job Template or Document Template attributes<sup>9</sup> or value in a Job Creation operation or a  
422 subsequent Document Creation operation for this job. The value 'true' indicates that total fidelity to client supplied  
423 Job Template and Document Template attributes and values is required for this Job Creation operation and all  
424 subsequent Document Creation operations for this job. If the client supplies the value 'false' or omits the attribute,  
425 then the Printer MUST accept the Job Creation operation and all subsequent Document Creation operations even if  
426 the client supplies unsupported attributes or values in them.

427 The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 9.1.1) and use  
428 its value for validating subsequent Document Creation operations for this job.

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

432

#### 433 3.1.2 Create-Job ([rfc2911] section 3.2.4)

434 This OPTIONAL operation creates the Job object with all of the mixture of Job and Document attributes supplied in  
435 the Create-Job operation. All Operation attributes supplied affect the Job as a whole. The client supplies Job  
436 Template attribute [rfc2911] that are a mixture of Job and Document attributes supplied together in the Job attribute  
437 group in the request<sup>10</sup>. For example, such Job Template attributes as "job-priority" and "job-hold-until" are Job  
438 attributes that affect the Job as a whole. On the other hand, such Job Template attributes as "media" and "number-  
439 up" are Document attributes that the client is supplying as defaults for the Document objects. The Document objects  
440 that are subsequently created for the specified Job are said to inherit the Document attributes from the Job object,  
441 unless the Document Creation operation supplies a corresponding Document Template attribute. However, the  
442 Printer MUST NOT copy down any Job Level attributes to the Document object as observable by a client in any Get-  
443 Documents or Get-Documents-Attributes operation responses.

444 A Printer that supports the Document object SHOULD support the Create-Job operation.

---

<sup>9</sup> The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other *Operation* attributes supplied by the client, only on Job Template and Document Template attributes supplied by the client.

<sup>10</sup> In the PWG Semantic Model, attributes are classified as Job Processing versus Document Processing in their definition. The client supplies them in separate Job Processing or Document Processing groups in the Job Creation operation. Such Document Processing attributes are defaults for subsequent Document Creation operations for that Job.



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

This REQUIRED operation creates one Document object as a side effect of the Print-Job operation. The Printer MUST copy the supported Operation attribute supplied by the client to the corresponding Job Description or Document Description attributes as indicated in Table 8. For example, the Printer copies the "job-name" and "attributes-charset" operation attributes to the corresponding Job Description attributes, while copying the "document-format" and "document-charset" Operation attributes to the corresponding Document Description attributes. The Printer MUST copy the supported Job Template attributes supplied by the client to the Job object and MUST NOT copy them down to the Document object. Any Job Template attributes supplied that affect Documents have effect on the Document object because the Document object inherits them from the Job object. The Printer MUST populate the single Document object's "document-state", "document-state-reasons", and "document-number" Document Description attributes with appropriate values. Thus a Get-Job-Attributes operation returns the same attributes for a Job created with Print-Job as a Printer that doesn't support the Document object. However, a Get-Documents or Get-Documents-Attributes for a Job created by Print-Job will return no Document Templates attributes (since the client can't submit any with Print-Job), but will return the populated Document Description attributes, such as "document-format".

Note: Using the Get-Job-Attributes and Get-Documents-Attributes, a Job created by Print-Job will be indistinguishable to a client from a Job created with Create-Job and Send-Document with no Document Template attributes supplied. Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and Send-Document (with no Document Template attributes supplied). However, if a new client supplies Document Template attributes on the Send-Document, instead of the same attributes as Job Template attributes on the Create-Job, then an old client will not see any of the Document Template attributes when it performs the Get-Job-Attributes operation (since the Printer does not "copy up" Document Template attributes to the Job Level on a Get-Job-Attributes on a one document job). ISSUE 02: OK that old clients don't see the Document Template attributes supplied by the new client or should we REQUIRE the Printer to return all the Document Template attributes of the first Document as Job Template attributes that don't have a corresponding Job Template attribute supplied?<PZ>It is OK that the old Clients do not see document template attributes supplied by new clients.</>

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

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

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

## 3.2 Get-Jobs ([rfc2911] section 3.2.6)

This REQUIRED Job operation returns requested attributes of either completed or not completed Jobs.

### 3.2.1 "limit" (integer(1:MAX)):

The client OPTIONALLY supplies this Operation attribute. The Printer MUST support this Operation attribute. It is an integer value that determines the maximum number of Jobs that a client will receive from the Printer even if "which-jobs" or "my-jobs" constrain which jobs are returned. The limit is a "stateless limit" in that if the value supplied by the client is 'N', then only the first 'N' jobs are returned in the Get-Jobs Response. There is no mechanism to allow for the next 'M' jobs after the first 'N' jobs. If the client does not supply the "limit" attribute, the Printer responds with all applicable Jobs.



### 3.3 Get-Documents Operation

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

This operation is similar to the Get-Document-Attributes operation (see section 4.5), except that this Get-Documents operation returns attributes from all Document objects contained in the Job object, instead of from a single selected Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return attributes that were submitted by a client when the Document object was created by the Create-Document, Send-Documents, or Send-URI operations and possibly modified by the Set-Document-Attributes operation (see section 4.6).

#### 3.3.1 Get-Documents Request

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

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

##### Group 1: Operation Attributes

###### Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

###### Target:

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

###### Requesting User Name:

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

##### 3.3.1.1 "limit" (integer(1:MAX)):

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

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

The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of Document attribute names and/or attribute groups names in whose values the requester is interested. This set of attributes is returned for each Document object that is returned. The allowed attribute group names are the same as those defined in the Get-Document-Attributes operation in section 4.5.1.

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

'document-number' (see section 9.2.14)

528

529 **3.3.2 Get-Documents Response**

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

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

535 **Group 1: Operation Attributes**536 **Status Message:**

537 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a  
538 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as  
539 described in [rfc2911] sections 13 and 3.1.6.

540 **Natural Language and Character Set:**

541 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

542 **Group 2: Unsupported Attributes**

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

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

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

550 The Printer responds with one set of Document Object Attributes for each returned Document object as  
551 specified by the "requested-attributes" Operation attribute supplied by the client in the request. The Printer  
552 ignores (does not respond with) any requested attribute or value which is not supported or which is restricted  
553 by the security policy in force, including whether the requesting user is the user that submitted the job (job  
554 originating user) or not (see [rfc2911] section 8). However, the Printer MUST respond with the 'unknown'  
555 value for any supported attribute (including all REQUIRED attributes) for which the Printer does not know the  
556 value, unless it would violate the security policy. See the description of the "out-of-band" values in the  
557 beginning of [rfc2911] section 4.1.

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

560 **3.4 Cancel-Job ([rfc2911] section 3.3.3)**

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

564

565 **3.5 Send-Document** ([rfc2911] section 3.3.1)

566 This OPTIONAL Job operation is a Document Creation operation that has been extended to accept a new Document  
567 Attributes group (Group 4) that the client can supply Document Template attribute and creates a Document object  
568 (see section 4.3 for the extension semantics).

569 **3.6 Send-URI** ([rfc2911] section 3.3.2)

570 This OPTIONAL Job operation is a Document Creation operation that has been extended to accept a new Document  
571 Attributes group (Group 4) that the client can supply Document Template attribute and creates a Document object  
572 (see section 4.4 for the extension semantics).

573 **3.7 Hold-Job** ([rfc2911] section 3.3.5)

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

577 **3.8 Release-Job** ([rfc2911] section 3.3.6)

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

581 **3.9 Restart-Job** ([rfc2911] section 3.3.7)

582 This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]  
583 section 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section  
584 4.7). Therefore, the Printer removes any 'canceled-by-xxx' values from any of the "document-state-reasons"  
585 attributes and the Job's "job-state-reasons" attributes so that any canceled Documents are reprocessed along with  
586 the other Documents.

587 **3.10 Reprocess-Job** ([adm-ops] section 4.1)

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

592 **4 Document Operations**

593 This section defines the Document Creation and Document operations. The Document object semantics are as  
594 parallel to the Job object semantics as possible. Therefore, most of the Job operations have analogous Document  
595 operations as shown in Table 17 in section "Appendix A: Document operations compared to Job operations".  
596 Operations that can apply only to an entire job, have no analogous document operation as indicated. This extension  
597 adds 7 new Document operations that operate on the Document object once it is created by the new Create-  
598 Document operation or either of the existing two operations: Send-Document and Send-URI operations.

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

601 The signatures of the operation requests that create and/or validate Document objects are very similar as shown in  
602 Table 4 and defined in section 4.1 through section 4.4. The entries in the table show what a client MUST, MAY, or  
603 MUST NOT supply in the indicated operation requests.

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

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

605

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

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

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

608

## 609 4.1 Create-Document

610 This **OPTIONAL** Document Creation operation allows a client to create a Document object, supply Document  
611 attributes, and have the Printer validate those attributes without sending any document content data. **The Printer**  
612 **MUST validate the Create-Document request in the context of the Job, including previously supplied Document**  
613 **Objects for the Job<sup>11</sup>**. If the Printer rejects the request, the client won't have sent the possibly time-consuming data.  
614 The client MUST perform the operations in the following order: (1) Create-Job to create the Job object, (2) Create-  
615 Document to create the Document object, (3) Send-Data (see section 4.2) to send the content data for the Document  
616 object.

617 The client can supply multiple documents for a single Job using pairs of Create-Document and Send-Data  
618 operations. The order of the corresponding Send-Data operations is not important, so that the client can send pairs

<sup>11</sup> Validating a Create-Document request in the context of the Job is the same as Validate-Job, except if the Printer supports multiple actual dissimilar devices for which none is a superset of all of the others. For example, a duplex black and white printer and a simplex color printer (not an uncommon mixture). Here a Validate-Job with "sides"=2 for the black and white document will succeed as will a Validate-Job with a "sides"='1' and "color-effect-type"='color' (see [color]) for the color document. However, the job containing both documents will not be able to be printed as requested on either device.

619 of Create-Document and Send-Data operations or can send a number of Create-Document operations followed by  
620 the corresponding Send-Data operations<sup>12</sup>. The latter approach is useful if the client wants to make sure that the  
621 Printer will accept all Documents before sending any of the Document data to the Printer.

622 The Printer sets the value of the Document's "document-state" Document Description attribute to 'pending', if the  
623 Printer accepts the Create-Document request. A Printer MAY set the 'job-data-insufficient' value of the Document's  
624 "document-state-reason" Document Description attribute to indicate that processing cannot begin until sufficient data  
625 has arrived and set the "document-state" to 'pending'. A non-spooling printer that doesn't implement the 'pending'  
626 document state may even set the "document-state" to 'processing', even though there is not yet any data to process.  
627 See sections 9.2.16 and 9.2.18.

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

#### 632 4.1.1 Create-Document Request

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

##### 634 Group 1: Operation Attributes

###### 635 Natural Language and Character Set:

636 First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes  
637 as described in [rfc2911] section 3.1.4.1. The Printer MUST copy these values to the corresponding Job  
638 Description attributes described in [rfc2911] sections 4.3.19 and 4.3.20.

###### 639 Target:

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

###### 643 Requesting User Name:

644 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in  
645 [rfc2911] section 8.3.

##### 646 4.1.1.1 last-document (boolean)

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

##### 651 4.1.1.2 document-message (text(MAX))

652 The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also  
653 support the corresponding "document-message" (text(MAX)) Document Description attribute (see section

---

<sup>12</sup> The concept of an "input-document-number" Operation attribute is not defined for Create-Document operations and will be deleted from the next version of the [pwg5100.4] for Send-Document and Send-Data operations. Therefore, the client MUST use the "document-numbers" returned by the Printer which the Printer assigns monotonically increasing from 1 for each Document in a multi-document Job. Overlapping sending data for a multi-document job, while possible, is unlikely to improve throughput, since it is the bandwidth of the network that is more likely to be the limiting factor, not the processing on the Printer.

9.2.11) and copy this value to the "document-message" Document Description attribute. The end user can use this Document Description attribute as a message to the operator and the operator can use it as a message to the user. The Printer MAY print this message on a document start sheet for this document, if any.

#### 4.1.1.3 Additional Operation attributes:

Any of the other Operation attributes indicated in the "Level Supplied" column labeled with a "y" in the "Doc" column in Table 8, such as "document-name", "document-format"; and "document-format-details" attributes. These Operation attributes are said to be supplied at the Document Level and apply to the Document object, overriding any Operation attributes supplied at the Job Level. For example, if "document-format" = 'application/postscript' at the Job Level and "document-format" = 'text/plain' in this Create-Document request, this Document will be 'text/plain'. If the next Create-Document request for this Job omits the "document-format" Operation attribute, that Document will be 'application/postscript'.

#### 4.1.1.4 Ignoring unsupported or improper Operation attributes:

The Printer MUST ignore any Operation attributes which are unsupported or are not defined for use with the Create-Document operation, such as "ipp-attribute-fidelity" (see section 3.1.1) and "job-mandatory-attributes" (see section **Error! Reference source not found.**) which are defined for use in Job Creation operations only.

### Group 2: Document Template Attributes

#### Any Document Template attributes in any order:

The client OPTIONALLY supplies a set of Document Template attributes, that is, any attributes indicated in Table 10 in the "Defined for use" column labeled with a "y" in the "D" column. These Document Template attributes are said to be supplied at the Document Level and apply to the Document object, overriding any Document Template attributes supplied at the Job Level. For example, if "media" = 'na-letter-white' at the Job Level and "media" = 'na-letter-transparency' in this Create-Document request, this Document will be 'na-letter-transparency'. If the next Create-Document operation for this Job omits the "media" Operation attribute, that Document will be 'na-letter-white' which it inherits from the Job.

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

The client MUST NOT supply the document data in this operation request. See Send-Data operation (section 4.2).

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

*Subscription object are defined only in Job Creation operations for job and/or document events.*

In addition to the MANDATORY parameters required for every operation request (see [rfc2911]), the simplest Create-Document request consists of just the "attributes-charset" and "attributes-natural-language" Operation attributes; either (1) the "printer-uri" target Operation attribute and the "job-id" or (2) the "job-uri" and nothing else. In this simple case, the Printer:

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

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



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

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

## 699 4.1.2 Create-Document Response

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

### 701 Group 1: Operation Attributes

#### 702 Status Message:

703 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a  
704 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as  
705 described in [rfc2911] sections 13 and 3.1.6.

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

707 (1) the "ipp-attribute-fidelity" Operation attribute (see section 3.1.1) with a 'true' value and the client  
708 supplies any unsupported and/or conflicting Job Template or Document Template attributes in this  
709 Document Creation request OR

710 (2) keyword values of the "job-mandatory-attributes" Operation attribute (see sections **Error!**  
711 **Reference source not found.** and **Error! Reference source not found.**) that identified Document  
712 Template attributes supplied in this Create-Document request that are unsupported and/or  
713 conflicting.

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

#### 717 Natural Language and Character Set:

718 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

### 719 Group 2: Unsupported Attributes

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

721 The value of the "ipp-attribute-fidelity" and the "job-mandatory-attributes" Operation attributes supplied by the  
722 client in the original Job Creation request does not affect what attributes the Printer returns in this group.  
723 The values of these two Operation attributes in the original Job Creation request only affect whether the  
724 Create-Document operation is accepted or rejected. If the request is accepted, the client MAY query the  
725 Document object using the Get-Document-Attributes operation (see section 4.5) requesting the unsupported  
726 attributes that were returned in the Document Creation response to see which attributes were ignored (not  
727 stored on the Document object) and which attributes were stored with other (substituted) values.

### 728 Group 3: Job Object Attributes

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



732 "job-uri" (uri) - see [rfc2911] section 4.3.1  
733 "job-id" (integer(1:MAX)) - see [rfc2911] section 4.3.2  
734 "job-state" (type1 enum) - see [rfc2911] section 4.3.7  
735 "job-state-reasons" (1setOf type2 keyword) - see [rfc2911] section 4.3.8  
736

737 The Printer MAY return:

738 "job-state-message" (text(MAX)) - see [rfc2911] section 4.3.9  
739 "number-of-intervening-jobs" (integer(0:MAX)) - see [rfc2911] section 4.3.15  
740

#### 741 **Group 4: Document Object Attributes**

##### 742 **4.1.2.1 document-number (integer(1:MAX))**

743 The Printer MUST return the document number of this Document object that was assigned by the Printer  
744 starting with 1 for each Job.

##### 745 **4.1.2.2 document-state (type1 enum)**

746 The Printer MUST return the state of this Document object (see section 9.2.16).

##### 747 **4.1.2.3 document-state-reasons (1setOf type2 keyword)**

748 The Printer MUST return the associated state reasons for this Document (see section 9.2.18).

##### 749 **4.1.2.4 document-state-message (text(MAX))**

750 The Printer MAY return the localized description of the "document-state" and "document-state-reasons"  
751 values for this Document (see section 9.2.17).

## 752 **4.2 Send-Data**

753 This **OPTIONAL** Document operation sends the data for the Document object once the Document has been created  
754 by a previous Create-Documents operation (see section 4.1). Because the Printer validates the Create-Documents  
755 before the client sends any document content data, the client can skip sending the data to the Printer, if the Printer  
756 rejects the Document Creation operation.

757 Since the Create-Documents and the Send-Data operation that follows could occur over an arbitrarily long period of  
758 time for a particular Document, a client MUST send the Send-Data operation within an IPP Printer defined minimum  
759 time interval after the receipt of the previous request for the job. If a Printer supports the Document object, the  
760 Printer MUST support the "multiple-operation-time-out" attribute (see [rfc2911] section 4.4.31). This attribute  
761 indicates the minimum number of seconds the Printer will wait for the next Document Creation or Close-Job (see  
762 section **Error! Reference source not found.**) operation before taking some recovery action. See the description  
763 under Send-Document in [rfc2911] section 3.3.1, for the possible Printer actions, if the client does not supply a Send-  
764 Data or Close-Job request in time.

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

#### 4.2.1 Send-Data request

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

##### Group 1: Operation Attributes

###### Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in section [rfc2911] 3.1.4.1.

###### Target:

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

###### Requesting User Name:

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

##### Group 2: Document Content

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

#### 4.2.2 Send-Data Response

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

##### Group 1: Operation Attributes

###### Status Message:

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

###### Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

##### Group 2: Unsupported Attributes

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

##### Group 3: Job Object Attributes

The Printer MUST return the same set of Job status attributes as for the Print-Job, Send-Document, and Create-Document responses (see section 4.1.2).

##### Group 4: Document Object Attributes

The Printer MUST return the same set of Document status attributes as for the Create-Document operation response (see section 4.1.2)

## 4.3 Send-Document

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

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

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

### 4.3.1 Send-Document Request

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

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

As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 8. For example, "compression", "document-format", and "document-name". So this group is the same as for Create-Document (see section 4.1.1).

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

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

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

The client **MUST** supply the document data in-line to be processed for this Document if the "last-document" flag is set to 'false'. However, since a client might not know that the previous Document Creation operation that the client had supplied (Create-Document/Send-Data pair, a Send-Document, or a Send-URI operation) was the last document (i.e., the client had supplied the "last-document" attribute with a 'false' value), the client **MUST** use either (1) the Close-Job operation (see section **Error! Reference source not found.**) or (2) a Send-Document request with no document data where the "last-document" flag is set to 'true'. For this Send-Document case with no data, the Printer **MUST NOT** increment the value of the Job object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is only an empty job which is scheduled and processed normally.

### 4.3.2 Send-Document Response

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

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

#### 840 **Status Message:**

841 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a  
842 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as  
843 described in [rfc2911] sections 13 and 3.1.6.

#### 844 **Natural Language and Character Set:**

845 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

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

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

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

849 The Printer MUST return the same set of Job status attributes as for the Print-Job, Send-Document, and  
850 Create-Document responses (see section 4.1.2).

### 851 **Group 4: Document Object Attributes (new - as in Create-Document Group 3 - see section 4.1.2)**

852 The Printer MUST return the same set of Document status attributes as for the Create-Document operation  
853 response (see section 4.1.2).

## 854 **4.4 Send-URI**

855 This OPTIONAL Document Creation operation has the same request and response semantics as the Send-  
856 Document operation (see section 4.3) except that a client MUST supply a URI reference ("document-uri" Operation  
857 attribute) rather than the document data itself. If a Printer supports this operation, clients can use any of (1) Send-  
858 URI, (2) Send-Document, and/or (3) Create-Document/Send-Data operations to add new documents to an existing  
859 multi-document Job object. However, if a client needs to indicate that the previous Send-URI, Send-Document, or  
860 Create-Document/Send-Data was the last document, the client MUST use either (1) the Close-Job operation (see  
861 section **Error! Reference source not found.**) or (2) the Send-Document operation (see section 4.3) with no  
862 document data and the "last-document" flag set to 'true' as specified in [rfc2911] section 3.3.2 (rather than using a  
863 Send-URI operation with no "document-uri" Operation attribute).

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

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

## 868 **4.5 Get-Document-Attributes**

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

873 The Printer MUST return the attributes that a client supplied in the Create-Document, Send-Document, or Send-URI  
874 operations, plus any Document Description attributes that the Printer has generated. The Printer MUST NOT return  
875 any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object

876 attributes and return them as Job object attributes. Thus the Get-Document-Attributes returns to clients the attributes  
877 that clients submitted with the Job object and with the Document object.

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

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

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

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

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

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

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

#### 898 4.5.1 Get-Document-Attributes Request

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

##### 901 Group 1: Operation Attributes

###### 902 Natural Language and Character Set:

903 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

###### 904 Target:

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

###### 910 Requesting User Name:

911 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in  
912 [rfc2911] section 8.3.

#### 4.5.1.1 "requested-attributes" (1setOf keyword):

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

### 4.5.2 Get-Document-Attributes Response

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

#### Group 1: Operation Attributes

##### Status Message:

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

##### Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2. The "attributes-natural-language" MAY be the natural language of the Document object, rather than the one requested.

#### Group 2: Unsupported Attributes

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

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

#### Group 3: Document Object Attributes

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

### 4.6 Set-Document-Attributes

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

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



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

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

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

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

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

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

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

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

Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
'pending'	'pending'	'successful-ok'



Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
'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'

995

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

#### 999 4.6.1 Settable and READ-ONLY Document Description attributes

1000 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:  
 1001 all Document Template document ("xxx") attributes  
 1002 that the implementation supports (see the column labeled "D" in Table 10).

1003 Almost all Document Description attributes (see [rfc2911] section 4.3) MUST NOT be settable, i.e., they are defined  
 1004 to be READ-ONLY. Only Document Description attributes marked with "(r/w)" in Table 10 MAY be settable using Set-  
 1005 Document-Attributes. The Printer MUST reject a Set-Document-Attributes request that attempts to set any attributes  
 1006 in Table 11 that are not marked "(r/w)".

1007 Note: From now on, all extensions that define new Document object attributes will indicate whether or not the  
 1008 attributes are READ-ONLY, by including the "READ-ONLY" adjective in their descriptions and/or explicitly stating  
 1009 whether they MAY be settable.

1010 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job  
 1011 owner (as determined in the Job Creation operation) or an operator or administrator of the Printer (see [rfc2911]  
 1012 Sections 1 and 8.5).

#### 1013 4.6.2 Set-Document-Attributes Request

1014 The following sets of attributes are part of the Set-Document-Attributes Request:

##### 1015 Group 1: Operation Attributes

##### 1016 Natural Language and Character Set:

1017 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

##### 1018 Target:

1019 The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after  
 1020 either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s)  
 1021 which define the target Document object for this operation as described in [rfc2911] section 3.1.5. If the  
 1022 client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the  
 1023 'client-error-bad-request' status code.

1024 Note: There is no way in a single operation for the client to set all of a Job's Document objects to the same  
1025 attribute value. Either (1) the client sets the corresponding attribute in each Document object in the Job with  
1026 separate Set-Documents-Attributes requests, or (2) the client sets the corresponding attribute at the Job Level  
1027 using the Set-Job-Attributes operation. Setting the corresponding attribute at the Job Level (or supplying that  
1028 attribute initially in the Job Creation operation) causes each Document object to inherit the Job Level  
1029 attribute value, if the Document object doesn't have a corresponding explicit attribute supplied at the  
1030 Document Level. In other words, supplying an attribute at the Job Levels will affect all the Job's Document  
1031 objects that don't have that attribute also explicitly supplied at the Document Level.

1032 **Requesting User Name:**

1033 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in  
1034 [rfc2911] section 8.3.

1035 **Group 2: Document Attributes**

1036 The client MUST supply a set of Document Template attributes with one or more values (including explicitly  
1037 allowed out-of-band values) as listed in column labeled "D" in Table 10 - Job Template and Document  
1038 Template attributes and Document Description attributes flagged with "(r/w)" and listed in the column labeled  
1039 "Doc" in Table 11 - Job and Document Description attributes, and any attribute extensions supported by the  
1040 Printer. The value(s) of each Document attribute supplied in Group 2 replaces the value(s) of the  
1041 corresponding Document attribute on the target Document object. For attributes that can have multiple  
1042 values (1setOf), all values supplied by the client replace all values of the corresponding Document object  
1043 attribute.

1044 In order to set the Document's "document-message" Document Description attribute (see section 9.2.11), the  
1045 client MUST supply the attribute in Group 2, rather than supplying a "document-message" Operation attribute  
1046 in Group 1.

1047 If the client supplies an "xxx" attribute with the 'delete-attribute' out-of-band value (see [rfc3380] section 8.2),  
1048 the Printer MUST remove the "xxx" attribute from the Document object, if present.

1049 **4.6.3 Set-Documents-Attributes Response**

1050 The Printer returns the following sets of attributes as part of the Set-Documents-Attributes Response:

1051 **Group 1: Operation Attributes**

1052 **Status Message:**

1053 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a  
1054 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as  
1055 described in [rfc2911] sections 13 and 3.1.6.

1056 **Natural Language and Character Set:**

1057 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

1058 **Group 2: Unsupported Attributes**

1059 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1060 If some of the attributes in the operation fail to validate, the Printer MUST reject the operation, MUST NOT  
1061 change any Document attributes, and MUST return the indicated status code below. In this group, the  
1062 Printer MUST also return all attributes that fail to validate. The following are the reasons that an attribute  
1063 fails to validate and the value returned for the attribute, along with the indicated status code and order of  
1064 detection:

- 1065 1. The number of attributes supplied by the client exceeds the maximum number that the Printer  
1066 supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see  
1067 [rfc2911] section 13.1.4.9).
- 1068 2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band  
1069 attribute value (see [rfc2911] section 3.1.7 and [rfc2910]) and the 'client-error-attributes-or-values-  
1070 not-supported' (see [rfc2911] section 13.1.4.12).
- 1071 3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation: return the  
1072 attribute with the 'not-settable' out-of-band attribute value (see [rfc3380] section 8.1) and the  
1073 'client-error-attributes-not-settable' status code (see [rfc3380] section 7.1).
- 1074 4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.  
1075 If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not  
1076 supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911]  
1077 section 13.1.4.12).
- 1078 5. The values of some of the supplied attributes conflict with one another and/or other Document  
1079 attribute values not being set: if the conflicting attribute in the operation has a single value return  
1080 the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute  
1081 and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-  
1082 conflicting-attributes' status code (see [rfc2911] section 13.1.4.15).

## 1083 4.7 Cancel-Document

1084 This REQUIRED Document operation allows a client to cancel a specified Document in a specified Print Job any time  
1085 from the time the Document is created up to, but not including, the time that the Document is completed, canceled, or  
1086 aborted. Since a Document might already be printing by the time a Cancel-Document is received, some media sheet  
1087 pages might be printed before the document processing is actually terminated.

1088 The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified  
1089 Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-  
1090 reasons" Document Description attribute to 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed  
1091 again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job  
1092 operation (see [rfc2911] section 3.3.7), any canceled Documents are also printed again. Thus Cancel-Document has  
1093 the same semantics as Cancel-Job (see [rfc2911] section 3.3.3), which only cancels the processing of the job, and  
1094 doesn't delete the Job object itself. See the Delete-Document operation (section 5.4) to remove the Document object  
1095 itself immediately from the Job and Printer.

1096 The Cancel-Document operation does not affect the states of any of the other Document objects in the job. If the Job  
1097 was processing and there are more Documents to be processed, the Printer does so. If there are no further  
1098 Documents to process, the Job moves to the 'completed' state as usual whenever there is no more processing to be  
1099 done.

1100 The Printer MUST accept or reject the request based on the document's current state and transition the document to  
1101 the indicated new state as follows:

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

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

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

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

### 4.7.1 Cancel-Document Request

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

#### Group 1: Operation Attributes

##### Natural Language and Character Set:

The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

##### Target:

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

##### Requesting User Name:

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

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

#### Operation attribute

The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also support the corresponding "document-message" (text(MAX)) Document Description attribute (see section 9.2.11) and copy this value to the "document-message" Document Description attribute. The end user can use this Document Description attribute as a message to the operator and the operator can use it as a message to the user. The Printer MAY print this message on a document start sheet for this document, if any.

1134 The Printer MUST ignore the new "job-message-from-operator" Operation attribute (see [adm-ops] section 6)  
1135 for this operation, since that is a job only attribute and Cancel-Document is a Document operation.

#### 1136 4.7.2 Cancel-Document Response

1137 The following sets of attributes are part of the Cancel-Document Response:

##### 1138 Group 1: Operation Attributes

###### 1139 Status Message:

1140 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a  
1141 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as  
1142 described in [rfc2911] sections 13 and 3.1.6.

###### 1143 Natural Language and Character Set:

1144 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

##### 1145 Group 2: Unsupported Attributes

1146 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1147 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up  
1148 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document  
1149 enters the 'canceled' document-state (see section 9.2.16), the "document-state-reasons" attribute (see section  
1150 9.2.18) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the  
1151 Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

## 1152 5 Administrative Job and Document operations

1153 This section summarizes the extensions to existing Administrative Job and Printer operations and defines new  
1154 Document Administrative operations.

### 1155 5.1 Purge-Jobs ([rfc2911] section 3.2.9)

1156 This OPTIONAL Administrative Printer operation removes all Job and all of their contained Document objects.

### 1157 5.2 Cancel-Current-Job ([adm-ops] section 4.2)

1158 This OPTIONAL Administrative Printer operation sets the "document-state" Document Description attribute to  
1159 'canceled' and the "document-state-reasons" Document Description attribute to 'canceled-by-xxx' for any documents  
1160 in the current Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted'), where "xxx" is  
1161 'user' or 'operator'. See [adm-ops] section 4.2.

1162 Note: There is no Cancel-Current-Document operation defined, since it is too likely that the Printer would have  
1163 moved onto the next document before the operation could issue the request.

### 1164 5.3 Suspend-Current-Job ([adm-ops] section 4.3.1)

1165 This OPTIONAL Administrative Printer operation suspends the current job and sets the Job's "job-state" Job  
1166 Description attribute to 'processing-stopped' and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user'

1167 or 'operator'. The Documents' "document-state" and "document-state-reasons" Document Description attributes are  
1168 unaffected (but the Documents are not processed any further, since the Job is stopped).

## 1169 5.4 Delete-Document

1170 This OPTIONAL Administrative Document operation removes the specified Document object and its data  
1171 immediately from the specified Job. The Printer MUST reject the request if the Document is in any state, but  
1172 'pending' (there is no 'pending-held' state for Documents). The Printer does not reassign the "document-number"  
1173 Document Description attribute values of the remaining Document objects in the Job, so that the deleted Document  
1174 object leaves a gap in the document numbering space for the Job. The Printer MUST return a 'client-error-not-found'  
1175 status code, in a subsequent Get-Document-Attributes operation for this Document object specifying its former  
1176 "document-number". This operation is similar to the Purge-Jobs operation which immediately deletes all jobs from  
1177 the Printer. However, the Delete-Document operation only deletes a single Document from the specified Job.

1178 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation MUST be an operator or  
1179 administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and  
1180 return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate. This  
1181 operation requires operator/administrator privileges, otherwise a rogue client could submit, then delete, at will using  
1182 up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-Document which goes  
1183 through the normal accounting, if any.

1184 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the  
1185 Cancel-Document operation (see section 4.7).

## 1186 6 Job and Document Template Attribute Precedence during Job processing

1187 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including  
1188 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document  
1189 Object attributes (Operation/Document Description and Document Template), Document Override attributes, Job  
1190 Object attributes (Operation/Job Description and Job Template), PDL instructions, PDL Interpreter initialization files,  
1191 and Printer's defaults. Since each attribute can be specified for all of these levels, it is important to define which level  
1192 takes precedence when the same attribute occurs at different levels with differing values.

1193 The attribute precedence model has the following features:

- 1194 1) In principle, each defined attribute can occur at each of the precedence levels.
- 1195 2) 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 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,  
1198 operator, Printer, and the output device hardware.
  - 1199 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job  
1200 pending, job processing.
- 1201 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print  
1202 driver, submission client, protocol, and Printer.
- 1203 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to  
1204 the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to  
1205 reflect the user's wishes.



1206 The following levels of Attribute Precedence are defined in order of decreasing priority:

- 1207 1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section  
1208 3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute  
1209 to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =  
1210 'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the  
1211 long edge.  
1212 Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for  
1213 its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all  
1214 Printers independent of the "pdl-override-supported" value.
- 1215 2. **Document Level - page override programming** - The special "page-overrides" collection Document  
1216 Template attribute (see [pwg5100.4]) supplied at the Document Level, that is, in a Create-Documents,  
1217 Send-Documents, or Send-URI operation, that contains the attributes that are to have the page override  
1218 status for the specified ranges of pages in the Input-Documents or the Output-Documents. Supplied by the  
1219 client when submitting a Document object, or set by the user or operator after the Document has been  
1220 accepted either using the Set-Documents-Attributes operation, or by the operator using means local to the  
1221 Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}
- 1222 3. **Job Level - page override programming** - The special "page-overrides" collection Job Template  
1223 attribute (see [pwg5100.4]) supplied at the Job Level, that is, in a Job Creation operation, that contains  
1224 the attributes that are to have the page override status for the specified ranges of pages in the Input-  
1225 Document or the Output-Documents. Supplied by the client when submitting a job either in the protocol,  
1226 or set by the user or operator after the job has been accepted either using the Set-Job-Attributes  
1227 operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-  
1228 documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}
- 1229 4. **Document Level - Document object attributes** - The Document attributes supplied at the Document  
1230 Level, that is, Operation/Document Description and Document Template attributes supplied in a Create-  
1231 Document, Send-Documents, or Send-URI operation to apply to the Input Document. Supplied by the  
1232 client when submitting a Document object, or set by the user or operator after the Document has been  
1233 accepted either using the Set-Job-Attributes operation, or by the operator using means local to the  
1234 Printer. Examples: "media" = 'na-letter' and "copies" = '2'.
- 1235 5. **Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job  
1236 Description and Job Template) and Document attributes (Operation/Document Description and  
1237 Document Template) supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation.  
1238 Supplied by the client when submitting a Job in the protocol, or set by the user or operator after the job  
1239 has been accepted either using the Set-Job-Attributes operation, or by the operator using means local to  
1240 the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.
- 1241 6. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print  
1242 driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether  
1243 PDL document data is actually lower precedence than the preceding levels depends on the  
1244 implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]  
1245 section 4.4.28 and [ippsave] section 8.1).  
1246  
1247 Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-  
1248 requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a  
1249 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"  
1250 attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-  
1251 requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation  
1252 and PCL MAY omit orientation, in which case, "orientation-requested" takes affect.



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

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

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

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

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

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

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

Table 7- Operation, Default, and Supported Attributes

Operation attribute	Operation attribute syntax	Default Value attribute syntax	Supported Values attribute syntax
<b>attributes-charset</b>	charset	-	1setOf charset <sup>13</sup>
<b>attributes-natural-language</b>	naturalLanguage	-	1setOf naturalLanguage
<b>compression</b>	type3 keyword	-	1setOf type3 keyword
<b>document-charset</b>	charset	charset	1setOf charset
<b>document-format</b>	mimeMediaType	mimeMediaType	1setOf mimeMediaType

<sup>13</sup> The Supported Printer attribute is named "charset-supported" (see [rfc2911] section 4.4.18), rather than "attributes-charset-supported".

Operation attribute	Operation attribute syntax	Default Value attribute syntax	Supported Values attribute syntax
<b>document-message</b>	text(MAX)	-	-
<b>document-name</b>	name(MAX)	-	-
<b>document-natural-language</b>	naturalLanguage	naturalLanguage	1setOf naturalLanguage
<b>document-uri</b>	uri	-	1setOf uriScheme <sup>14</sup>
<b>ipp-attribute-fidelity</b>	boolean	-	-
<b>[job-]impressions</b>	integer(0:MAX)	-	rangeOfInteger(0:MAX)
<b>[job-]k-octets</b>	integer(0:MAX)	-	rangeOfInteger(0:MAX)
<b>[job-]media-sheets</b>	integer(0:MAX)	-	rangeOfInteger(0:MAX)
<b>job-name</b>	name(MAX)	-	-
<b>job-password</b>	octetString(255)	-	integer(0:127)
<b>job-password-encryption</b>	type3 keyword   name(MAX)	-	1setOf (type3 keyword   name(MAX))
<b>last-document</b>	boolean	-	-
<b>operation-id</b>	integer(1:0x8FFF)	-	1setOf type2 enum <sup>15</sup>
<b>original-requesting-user-name</b>	name(MAX)	-	-
<b>page-overrides</b>	1setOf collection <sup>16</sup>	-	1setOf type2 keyword
<b>printer-uri</b>	uri	-	1setOf uri
<b>request-id</b>	integer(1:MAX)	-	-
<b>requesting-user-name</b>	name(MAX)	-	-
<b>version-number</b>	X.Y	-	1setOf type2 keyword <sup>17</sup>

1281

1282 Table 8 lists the Operation attributes that clients supply at the Job Level and/or the Document Level and whether the  
1283 Printer copies (indicated by “⇒”) the supplied value to corresponding Job Description and/or Document Description  
1284 attributes.

1285      Legend:

1286 **[job-]** an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute name  
1287 could also be used for the Document object as an Operation/Document Description attribute. When this  
1288 attribute is used as an Operation/Document Description attribute, the **[job-]** prefix is dropped. Note: For the  
1289 PWG Semantic Model, the "job-" prefix is dropped.

<sup>14</sup> The Supported Printer attribute is named "reference-uri-schemes-supported" (see [rfc2911] section 4.4.27), rather than "document-uri-supported".

<sup>15</sup> The Supported Printer attribute is named "operations-supported" (see [rfc2911] section 4.4.15), rather than "operation-id-supported".

<sup>16</sup> See “page-overrides” in Table 10 for the list of its member attributes.

<sup>17</sup> The Supported Printer attribute is named "ipp-versions-supported" (see [rfc2911] section 4.4.14), rather than "version-number-supported".

- 1290 **“Level Supplied”** column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,  
 1291 PU=Print-URI, and CJ=Create-Job) and at the Document Level (CD=Create-Document, SD=Send-  
 1292 Document, and SU=Send-URI).
- 1293 **“y”** the Operation attribute is defined for the indicated operation, but does not have a corresponding Job  
 1294 Description or Document Description attribute (no “⇒”).
- 1295 **“y⇒”** the Operation attribute has a corresponding Job Description or Document Description attribute to which the  
 1296 Printer MUST copy this Operation attribute. See Table 11 for the corresponding Job and Document  
 1297 Description attributes and whether there are corresponding “xxx-default” and “xxx-supported” Printer  
 1298 Description attribute defined.
- 1299 **“-”** the Operation attribute is *not* defined for the indicated operation.
- 1300 **\*\*** these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation  
 1301 operations
- 1302 **“Conformance”** column indicates the conformance requirements for what the client supplies in a request and the  
 1303 Printer supports in a request.
- 1304 **“Reference and Section”** column indicates where the Operation attribute is defined in other IPP specs and this spec.  
 1305

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

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		PJ, PU	CJ	CD, SD, SU	Client supply	Printer support	
attributes-charset **	charset	y⇒	y⇒	y⇒	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	y⇒	y⇒	y⇒	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	y⇒	-	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-format	mimeMediaType	y⇒ 18	-	y⇒ 18	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §7.2.2
document-message **	text(MAX)	-	-	y⇒	MAY	MAY	[this spec] §4.1.1.2
document-name	name(MAX)	y⇒	-	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	y⇒	-	y⇒	MAY	MAY	[rfc2911] §3.2.1.1, [this spec] §7.2.3
document-uri	uri	y	-	y⇒	CMUST 19	MAY	[rfc2911] §3.2.2

<sup>18</sup> The Printer MUST copy the “document-format” Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc			
		PJ, PU	CJ	CD, SD, SU	Client supply	Printer support	
<b>ipp-attribute-fidelity</b>	boolean	y <sub>20</sub> ⇒	y <sub>20</sub> ⇒	-	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1,
<b>[job-]impressions</b>	integer(0:MAX)	y⇒	y⇒	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
<b>[job-]k-octets</b>	integer(0:MAX)	y⇒	y⇒	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
<b>[job-]media-sheets</b>	integer(0:MAX)	y⇒	y⇒	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
<b>job-name</b>	name(MAX)	y⇒	y⇒	-	MAY	MUST	[rfc2911] §4.3.5
<b>job-password</b>	octetString(255)	y⇒	y⇒	-	MAY	MAY	[ippsave] §4.1
<b>job-password-encryption</b>	type3 keyword   name(MAX)	y⇒	y⇒	-	MAY	MAY	[ippsave] §4.2
<b>last-document</b>	boolean	-	-	y <sub>21</sub> ⇒	MUST	MUST	[rfc2911] §3.3.1.1, [this spec] §4.1.1.1
<b>operation-id **</b>	integer(1:0x8FFF)	y	y	y	MUST	MUST	[rfc2911] §3.1.2
<b>original-requesting-user-name **</b>	name(MAX)	y⇒	y⇒	-	MAY	MAY	[adm-ops] §11.7.2.2
<b>page-overrides</b>	1setOf collection <sup>22</sup>	-	-	y <sub>23</sub> ⇒	MAY	MAY	[pwg5100.4] §5.2, §9.2.3
<b>printer-uri **</b>	uri	y <sub>24</sub> ⇒	y <sub>24</sub> ⇒	y	MUST	MUST	[rfc2911] §3.1.5
<b>request-id **</b>	integer(1:MAX)	y	y	y	MUST	MUST	[rfc2911] §3.1.2
<b>requesting-user-name **</b>	name(MAX)	y	y	y	SHOULD	MUST	[rfc2911] §3.2.1.1
<b>version-number **</b>	X.Y	y	y	y	MUST	MUST	[rfc2911] §3.1.8

“y”, “y⇒”, and “\*\*\*”. See Legend at the beginning of the Table.

<sup>19</sup> The “document-uri” Operation attribute MUST be supplied in the Print-URI Job Creation operation and the Send-URI Document Creation operation, and MUST NOT be supplied in other operations.

<sup>20</sup> The Printer MUST copy the “ipp-attribute-fidelity” Operation attribute to the corresponding (new) Job Description attribute defined in this specification so that the Printer can remember its value for subsequent Document Creation operations.

<sup>21</sup> The Printer MUST copy the “last-document” Operation attribute to the corresponding (new) Document Description attribute defined in this specification so that the client can determine the last document when querying the Document objects.

<sup>22</sup> See “page-overrides” in Table 10 for the list of its member attributes.

<sup>23</sup> The preferred method for a client to supply “page-overrides” is as a Document Template attribute (see section 8). However, the “page-overrides” attribute is also an Operation attribute that the client MAY supply in the Send-Document or Send-URI operation in [pwg5100.4] as an Operation attribute, since there was no place for supplying Job Template or Document Template attributes until this IPP Document Object specification. The Printer copies the “page-overrides” Operation attribute to the corresponding Job Template Document attribute. There is no “page-overrides” Job or Document Description attribute.

<sup>24</sup> The Printer MUST copy the “printer-uri” Operation attribute to the Job’s “job-printer-uri” Job Description attribute and Document’s “document-printer-uri” Document Description attribute.

## 7.2 Operation/Document Description attributes

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

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

If the Printer supports the "xxx" Operation attribute, the Printer MUST also:

1. support the corresponding "xxx" Document Description attribute of the same name (see section 9.2) and vice versa.
2. copy the value of the "xxx" Operation attribute, if supplied by the client, to the corresponding "xxx" Document Description attribute.
3. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined (see section 10) and vice versa.
4. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 10). If the values do not validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the attributes described below.

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

### 7.2.1 compression (type2 keyword)

This REQUIRED Operation attribute identifies the compression of the Document Object content (see [rfc2911] section 3.2.1.1).

If a client supplies the "compression" Operation attribute with a value that the Printer doesn't support, the Printer MUST reject the job and return the status code: 'client-error-compression-not-supported' (see [rfc2911] section 3.1.4.16), since the Printer cannot process the data.

### 7.2.2 document-format (mimeMediaType)

This REQUIRED Operation attribute identifies the document format of the Document Object content (see [rfc2911] section 3.2.1.1).. If the client supplies this attribute, the Printer MUST copy its value, including MIME parameters, if any, to the corresponding REQUIRED<sup>25</sup> Document Description attribute (see section 9.2.8).

If a client supplies the "document-format" Operation attribute with a value that the Printer doesn't support, the Printer MUST reject the job and return the status code: 'client-error-document-format-not-supported' (see [rfc2911] section 3.1.4.11), since the Printer cannot process the data.

---

<sup>25</sup> The Printer MUST support the (new) "document-format" Document Description attribute defined in this specification.

The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation attribute (section **Error! Reference source not found.**) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the "document-charset" Operation attribute (section **Error! Reference source not found.**).

Many printer languages in the Printer MIB do not have a MIME type registered with IANA.<sup>26</sup> This specification registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type: 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL', so those MIME Media types MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the "document-format" = 'application/vnd.PWG-NPDL' MUST be used.

Note: It is proposed that CIP4 [cip4] register the YYY document formats with IANA as 'application/vnd.CIP4-YYY' that CIP4 is using that don't have a registered MIME Media type. For example, TIFF/IT [iso12639] would be registered as: 'application/vnd.CIP4-TIFF-IT'. Then CIP4 would keep a list of TIFF/IT versions. For example: 'TIFF/IT-CT/P1:1998' to use with the "document-format-version" attribute (and the CIP4 JDF equivalent MimeTypeVersion attribute).

**ACTION ITEM (Tom):** Get CIP4 buy-in to use the same flat file (which will require an additional field for the JDF FileType attribute. **ACTION ITEM (Tom and Ira):** Propose a format for the file.

See also the "document-format-version" Operation attribute in section **Error! Reference source not found.** and the "document-format-details" Operation attribute in section **Error! Reference source not found.**

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

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

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

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

'en': for English  
'en-us': for US English  
'fr': for French  
'de': for German

<sup>26</sup> Companies are urged to register their Printer languages with IANA using the 'application/vnd.XX-yyy' vendor tree. There has also been a long standing PWG proposal to register all of these as 'application/vnd.pwg-yyy'.



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

WORK Item: PZ needs to update based on new override spec

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

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

Similarly, according to [pwg5100.4], 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 (by supplying either the "input-documents" (1setOf rangeOfInteger (1:MAX)) or the "output-documents" (1setOf rangeOfInteger) member attribute). See the "page-overrides" Job Template attribute in Table 10 for the listing of the member attributes. However, with the introduction of the Document object, the "page-overrides" (collection) attribute MUST be supplied as a Document Template attribute in the Create-Document operation and SHOULD be more simply supplied as one of the Document Template attributes for the document being created in the Send-Document or Send-URI operation and for this Document only. However, if a Printer supports the "page-overrides" attribute as a Document Template attribute (in any Document Creation operations), a Printer MUST also support the "page-overrides" attribute as an Operation attribute in the Send-Document and Send-URI operations according to [pwg5100.4] for backward compatibility with clients that do not support the Document object.

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

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

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

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
attributes-charset *	charset	MUST	MUST	[rfc2911] §3.1.4
	'utf-8'	MAY	MUST	[rfc2911] §4.1.7
	'us-ascii'	MAY	MAY	[rfc2911] §4.1.7
	'iso-8859-1'	MAY	MAY	[rfc2911] §4.1.7
	'iso-10646-ucs-2'	MAY	MAY	[rfc2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[rfc2911] §3.1.4
	'en-US'	MAY	MAY	[rfc2911] §4.1.8

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
detailed-status-message *	text	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text	MAY	MAY	[rfc2911] §3.1.6.4
document-number	integer(1:MAX)	MUST	MUST	§9.2.14
job-id	integer(1:MAX)	MUST	MUST	[rfc2911] §4.3.2
job-uri	uri	MUST	MUST	[rfc2911] §4.3.1
redirect-uri (uri) <sup>27</sup>	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

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

## 8 Job Template and Document Template attributes

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

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

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

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

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

<sup>27</sup> 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.

1442 The “Defined for use” column indicates whether the client MAY supply and the Printer support the attribute at the  
1443 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.

1444  
1445 “\*\*\*” - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job  
1446 Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template  
1447 attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job  
1448 Processing attributes. These are indicated in the first column with “\*\*\*”.

1449 **Table 10 - Job Template and Document Template attributes**

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>copies</b>	integer(1:MAX)	<b>y</b> <sup>28</sup>	<b>y</b>	<b>n</b>	MAY	MAY	[rfc2911] §4.2.5

<sup>28</sup> 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.

<sup>30</sup> 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

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>imposition-template</b>	type2 keyword   name(MAX)	<b>y</b>	<b>y</b>	<b>y</b>	MAY	MAY	[pwg5100.3] §3.4
<b>insert-sheet</b>	1setOf collection	<b>y</b> <sup>30</sup>	<b>y</b>	<b>y</b>	MAY	MAY	[pwg5100.3] §3.5
<b>insert-after-page-number</b>	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.5.1
<b>insert-count</b>	integer(0:MAX)				MAY	MUST	[pwg5100.3] §3.5.2
<b>media</b>	type3 keyword   name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.5.3
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.5.3
<b>job-account-id **</b>	name(MAX)	<b>y</b>	<b>n</b>	<b>n</b>	MAY	MAY	[pwg5100.3] §3.6
<b>job-accounting-sheets</b>	collection	<b>y</b>	<b>n</b>	<b>n</b>	MAY	MAY	[pwg5100.3] §3.8
job-accounting-sheets-type	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.8.1
media	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.8.2
media-col	collection					MAY	[pwg5100.3] §3.8.2
job-accounting-output-bin	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.8.3
<b>job-accounting-user-id**</b>	name(MAX)	<b>y</b>	<b>n</b>	<b>n</b>	MAY	MAY	[pwg5100.3] §3.7
<b>job-copies</b>	integer(1:MAX)	<b>y</b>	<b>n</b> <sup>31</sup>	<b>n</b>	MAY	MAY	<b>§Error! Reference source not found.</b>

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.

<sup>31</sup> The “job-copies” Job Template attribute makes copies of the entire job and MUST NOT be supplied at the Document or Page Level. The “job-copies” Job Template attribute is equivalent to “copies” with “multiple-document-handling” = ‘single-document-new-sheet’.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>job-cover-back</b>	collection	y	n <sup>32</sup>	n	MAY	MAY	<b>§Error! Reference source not found.</b>
<i>same as cover-back</i>	<i>see cover-back</i>						
<b>job-cover-front</b>	collection	y	n <sup>33</sup>	n	MAY	MAY	<b>§Error! Reference source not found.</b>
<i>same as cover-front</i>	<i>see cover-front</i>						
<b>job-error-sheet</b>	collection	y	n	n	MAY	MAY	[pwg5100.3] §3.9
<b>job-error-sheet-type</b>	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.9.1
<b>job-error-sheet-when</b>	type2 keyword				MAY	MAY	[pwg5100.3] §3.9.2
<b>media</b>	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.9.3
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.9.3
<b>job-finishings</b>	1setOf type2 enum	y	n <sup>34</sup>	n	MAY	MAY	<b>§Error! Reference source not found.</b>
<b>job-finishings-col</b>	collection	y	n <sup>35</sup>	n	MAY	MAY	<b>§Error! Reference source not found.</b>
<i>same as finishings-col</i>	<i>see finishings-col</i>						
<b>job-hold-until</b>	type3 keyword   name(MAX)	y	n	n	MAY	MAY	[rfc2911] §4.2.2
<b>job-hold-until-time</b>	dateTime	y	n	n	MAY	MAY	[ippsave] §5.4
<b>job-message-to-operator</b>	text(MAX)	y	n <sup>36</sup>	n	MAY	MAY	[pwg5100.3] §3.10
<b>job-phone-number</b>	text(127)	y	n	n	MAY	MAY	[ippsave] §5.5
<b>job-priority</b>	integer(1:100)	y	n	n	MAY	MAY	[rfc2911] §4.2.1
<b>job-recipient-name **</b>	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.6
<b>job-save-disposition</b>	collection	y	n	n	MAY	MAY	[ippsave] §5.7
<b>save-disposition</b>	type3 keyword	y	n	n	MAY	MAY	[ippsave] §5.7.1.1
<b>save-info</b>	1setOf collection	y	n	n	MAY	MAY	[ippsave] §5.7.1.2
<b>save-location</b>	uri	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.1
<b>save-name</b>	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.2
<b>save-document-format</b>	mimeMediaType	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.3
<b>job-sheet-message</b>	text(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.12

<sup>32</sup> The “job-cover-back” Job Template attribute makes a single back cover for each job copy and MUST NOT be supplied at the Document or Page Level. The “job-cover-back” Job Template attribute is equivalent to “cover-back” with “multiple-document-handling” = ‘single-document-new-sheet’.

<sup>33</sup> The “job-cover-front” Job Template attribute makes a single front cover for each job copy and MUST NOT be supplied at the Document or Page Level. The “job-cover-front” Job Template attribute is equivalent to “cover-front” with “multiple-document-handling” = ‘single-document-new-sheet’.

<sup>34</sup> The “job-finishing” Job Template attribute finishes each job copy as a whole and MUST NOT be supplied at the Document or Page Level. The “job-finishings” Job Template attribute is equivalent to “finishings” with “multiple-document-handling” = ‘single-document-new-sheet’.

<sup>35</sup> The “job-finishing-col” Job Template attribute finishes each job copy as a whole and MUST NOT be supplied at the Document or Page Level. The “job-finishings-col” Job Template attribute is equivalent to “finishings-col” with “multiple-document-handling” = ‘single-document-new-sheet’.

<sup>36</sup> 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	
<b>job-sheets</b>	type3 keyword   name(MAX)	<b>y</b>	<b>n</b>	<b>n</b>	MAY be neither or one of, but NOT both	MAY, MUST if "job-sheets-col" supported	[rfc2911] §4.2.3
<b>job-sheets-col</b>	collection	<b>y</b>	<b>n</b>	<b>n</b>		MAY	[pwg5100.3] §3.1.1
<b>job-sheets</b>	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.11.1
<b>media</b>	type3 keyword   name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.11.2
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.11.2
<b>media</b>	type3 keyword   name(MAX)	<b>y</b>	<b>y</b>	<b>y</b>	MAY be neither or one of, but NOT both	MAY, MUST if "media-col" supported	[rfc2911] §4.2.11
<b>media-col</b>	collection	<b>y</b>	<b>y</b>	<b>y</b>		MAY	[pwg5100.3] §3.13
<b>media-back-coating</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
<b>media-color</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.4
<b>media-front-coating</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
<b>media-grain</b>	type3 keyword   name(MAX)				MAY	MAY	[ippsave] §8.4.2
<b>media-hole-count</b>	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.6
<b>media-info</b>	text(255)				MAY	MAY	[pwg5100.3] §3.13.3
<b>media-key</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.1
<b>media-material</b>	type3 keyword   name(MAX)				MAY	MAY	[ippsave] §8.4.3
<b>media-order-count</b>	integer(1:MAX)				MAY	MAY	[pwg5100.3] §3.13.7
<b>media-preprinted</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.5
<b>media-recycled</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.11
<b>media-size</b>	collection				MAY	MUST	[pwg5100.3] §3.13.8
<b>x-dimension</b>	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.1
<b>y-dimension</b>	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.2
<b>media-size-name</b>	type3 keyword   name(MAX)				MAY	MAY	§Error! Reference source not found.
<b>media-thickness</b>	integer(1:MAX)				MAY	MAY	[ippsave] §8.4.4
<b>media-tooth</b>	type3 keyword   name(MAX)				MAY	MAY	[ippsave] §8.4.1
<b>media-type</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.2
<b>media-weight-metric</b>	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.9
<b>media-input-tray-check</b>	type3 keyword   name(MAX)	<b>y</b>	<b>y</b>	<b>y</b>	MAY	MAY	[pwg5100.3] §3.14
<b>multiple-document-handling</b>	type2 keyword	<b>y</b>	<b>n</b>	<b>n</b>	MAY	<b>MUST</b> <sup>37</sup>	[rfc2911] §4.2.4
<b>number-up</b>	integer(1:MAX)	<b>y</b>	<b>y</b>	<b>y</b>	MAY	MAY	[rfc2911] §4.2.9
<b>orientation-requested</b>	type2 enum	<b>y</b>	<b>y</b>	<b>y</b>	MAY	MAY	[rfc2911] §4.2.10

<sup>37</sup> A Printer MUST support the "multiple-document-handling" Job Template attribute with at least one value.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>output-bin</b>	type2 keyword   name(MAX)	y	n	n	MAY	MAY	[pwg5100.2] §2.1
<b>page-delivery</b>	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.15
<b>page-order-received**</b>	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.16
<b>page-overrides</b>	1setOf collection	y <sup>38</sup>	y	n	MAY	MAY	[pwg5100.4] §5.2
input-documents	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.2.1
output-documents	1setOf rangeOfInteger(1:MAX)					MUST	[pwg5100.4] §5.2.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[pwg5100.4] §5.2.3
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[pwg5100.4] §5.2.4
<i>any other Job Template attributes that affect pages, such as "media" or "media-col"</i>					MAY	MAY	
<b>page-ranges</b>	1setOf rangeOfInteger(1:MAX)	y	y	n	MAY	MAY	[rfc2911] §4.2.7
<b>pages-per-subset</b>	1setOf integer(1:MAX)	y <sup>39</sup>	n	n	MAY	MAY	[pwg5100.3] §5.3
<b>pdl-init-file</b>	1setOf collection	y	y	n	MAY	MAY	[ippsave] §5.8
pdl-init-file-location	uri				MAY	MAY	[ippsave] §5.8.1.1
pdl-init-file-name	name(MAX)				MAY	MAY	[ippsave] §5.8.1.2
pdl-init-file-entry	name(MAX)				MAY	MAY	[ippsave] §5.8.1.3
<b>presentation-direction-number-up</b>	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.17
<b>print-quality</b>	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.13
<b>printer-resolution</b>	resolution	y	y	y	MAY	MAY	[rfc2911] §4.2.12
<b>proof-print</b>	collection	y	n	n	MAY	MAY	[ippsave] §5.9
proof-print-copies	integer (0:MAX)	y	n	n	MAY	MAY	[ippsave] §5.9.1.1
media	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[ippsave] §5.8.1.2
media-col	collection					MAY	[ippsave] §5.8.1.2
<b>separator-sheets</b>	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.18
separator-sheets-type	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.18.1
media	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.18.2
media-col	collection					MAY	[pwg5100.3] §3.18.2
<b>sheet-collate</b>	type2 keyword	y	y	n	MAY	MAY	[rfc3381] §3.1
<b>sides</b>	type2 keyword	y	y	y	MAY	MAY	[rfc2911] §4.2.8

<sup>38</sup> 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.

<sup>39</sup> The client MUST supply the "pages-per-subset" Job Template attribute at the Job Level and can only be used when the "multiple-document-handling" Job Template attribute is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies', 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	
<b>x-image-position</b>	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.2
<b>x-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.3
<b>x-side1-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.4
<b>x-side2-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.5
<b>y-image-position</b>	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.6
<b>y-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.7
<b>y-side1-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.8
<b>y-side2-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.9

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

## 8.1 Document Template attributes

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

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

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

## 9 Job Description and Document Description attributes

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

1474 The column labeled “attribute syntax” indicates the attribute syntax (see [rfc2911] section 4.1). The Printer  
 1475 conformance is indicated along with the reference to the specification in which the attribute is defined. The  
 1476 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the  
 1477 corresponding Job Description attributes.

1478 Each of the Document Description attributes have a sub-section in section 9.2. The column labeled References  
 1479 column contains references to the sub-section in this document if there is significant information there. Those  
 1480 subsections that are only references to other specifications contain only that reference in the Reference column.  
 1481 Those attributes that are only Job Description attributes with no subsection in this specification have a “n/a” in the  
 1482 “Doc Desc” column.

1483 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an  
 1484 object with a state and it cannot be queried.

1485 Legend:

1486 **[job-]** indicates an attribute that shouldn't have had a “job-” prefix in its name in [rfc2911], so that the same attribute  
 1487 name could also be used for the Document object as a Document Description attribute. Note: For the PWG  
 1488 Semantic Model, the “job-” prefix is dropped.

1489 “-” indicates that the Job or Document attribute is *not* defined.

1490 “⇒y” the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding  
 1491 Operation attribute that the client MAY supply<sup>40</sup> in a Job or Document Creation operation. See Table 8 for  
 1492 the corresponding Operation attribute.

1493 (r/w) indicates that the Job Description or Document Description attribute is read/write, so that the client can  
 1494 changes its value using the Set-Job-Attributes or Set-Docment-Attributes operation (see section 4.6).

1495

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

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
<b>attributes-charset</b>	charset	-	⇒y	MUST	[rfc2911] §4.3.19	§9.2.1
<b>attributes-natural-language</b>	naturalLanguage	-	⇒y	MUST	[rfc2911] §4.3.20	§9.2.2
<b>compression</b>	type3 keyword	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.2.3
<b>current-page-order</b>	type2 keyword	y	y	MAY	[pwg5100.3] §4.1	§9.2.4
<b>date-time-at-completed</b>	dateTime	y	y	MAY	[rfc2911] §4.3.14.7	§9.2.5
<b>date-time-at-creation</b>	dateTime	y	y	MAY	[rfc2911] §4.3.14.5	§9.2.6
<b>date-time-at-processing</b>	dateTime	y	y	MAY	[rfc2911] §4.3.14.6	§9.2.7
<b>document-charset</b>	charset	-	⇒y	CMUST <sup>41</sup>	-	<b>§Error! Referen ce source not found.</b>

<sup>40</sup> Document Description attributes that the client can supply in a Job or Document operation as Operation attributes (indicated with ⇒) comprise *all* of the Document Description attributes in the PWG Semantic Model ([pwgsm]). Those Document Description attributes that clients cannot supply values correspond to Document Status attributes in the PWG Semantic Model.

<sup>41</sup> The Printer MUST support the “document-charset” Operation/Document Description attributes if the Printer supports any charset-ambiguous document formats (see section **Error! Reference source not found.**).

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference Job Description Attr	Doc Desc.
<b>document-digital-signature</b>	type2 keyword	-	⇒y	MAY	-	<b>§Error! Referen ce source not found.</b>
<b>document-format</b>	mimeMediaType	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.2.8
<b>document-format-details</b>	1setOf collection	-	⇒y	CMUST <sup>42</sup>	-	<b>§Error! Referen ce source not found.</b>
<b>document-source-application-name</b>	name(MAX)	-	⇒y	MAY	-	<b>§Error! Reference source not found.</b>
<b>document-source-application-version</b>	text(127)	-	⇒y	MAY	-	<b>§Error! Reference source not found.</b>
<b>document-source-os-name</b>	name(40)	-	⇒y	MAY	-	<b>§Error! Reference source not found.</b>
<b>document-source-os-version</b>	text(40)	-	⇒y	MAY	-	<b>§Error! Reference source not found.</b>
<b>document-format</b>	mimeMediaType	-	⇒y	MUST	-	<b>§Error! Reference source not found.</b>
<b>document-format-device-id</b>	text(127)	-	⇒y	MUST	-	<b>§Error! Reference source not found.</b>
<b>document-format-version</b>	text(127)	-	⇒y	MAY	-	<b>§Error! Reference source not found.</b>
<b>document-natural-language</b>	naturalLanguage	-	⇒y	MAY	-	<b>§Error! Reference source not found.</b>

<sup>42</sup> The Printer MUST support the “document-format-details” Operation/Document Description attributes if the Printer supports a packaging MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference Job Description Attr	Doc Desc.
document-format-details- detected	1setOf collection	-	y	MAY	-	§Error! Referen ce source not found.
document-format-detected	mimeMediaType	-	y	MAY	-	§Error! Referen ce source not found.
document-format-version	text(127)	-	⇒y	MAY	-	§Error! Referen ce source not found.
document-format-version- detected	text(127)	-	y	MAY	-	§Error! Referen ce source not found.
document-job-id	integer(1:MAX)	-	y	MUST	-	§9.2.9
document-job-uri	uri	-	y	MUST	-	§9.2.10
document-message(r/w)	text(MAX)	- <sup>43</sup>	⇒y	MAY	-	§9.2.11
document-name(r/w)	name(MAX)	-	⇒y	MUST	-	§9.2.12
document-natural-language	naturalLanguage	-	⇒y	MAY	-	§9.2.13
document-number	integer(0:MAX)	-	y	MUST	-	§9.2.14
document-printer-uri	uri	-	y	MUST	-	§9.2.15
document-state	type1 enum	-	y	MUST	-	§9.2.16
document-state-message	text(MAX)	-	y	MAY	-	§9.2.17
document-state-reasons	1setOf type2 keyword	-	y	MUST	-	§9.2.18
document-uri	uri	-	⇒y	MAY	-	§9.2.19
impressions-completed- current-copy	integer(0:MAX)	y	y	MAY	[rfc3381] §4.4	§9.2.20
ipp-attribute-fidelity	boolean	⇒y	-	MUST	[rfc2911] §3.2.1.1 §9.1.1	-
job-collation-type	type2 enum	y	-	MAY	[rfc3381] §4.1	-
[job-]detailed-status-message	1setOf text (MAX)	y	y	MAY	[rfc2911] §4.3.10	§9.2.21
[job-]document-access-errors	1setOf text(MAX)	y	y	MAY	[rfc2911] §4.3.11	§9.2.22
job-id	integer (1:MAX)	y	-	MUST	[rfc2911] §4.3.2	-
[job-]impressions	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.2	§9.2.23

<sup>43</sup> The “document-message” (text(127)) Document Description attribute has a corresponding “job-message-from-operator” (text(127)) Job Description attribute (see [rfc2911] section 4.3.16) which handles operator to user communication only and a “job-message-to-operator” (text(MAX)) Job Template attribute (see [pwg5100.3] section 3.10) for user to operator communication.



Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference Job Description Attr	Doc Desc.
<b>[job-]impressions-completed</b>	integer(0:MAX)	<b>y</b>	<b>y</b>	MAY	[rfc2911] §4.3.18.2	§9.2.24
<b>[job-]k-octets</b>	integer(0:MAX)	<b>⇒y</b>	<b>⇒y</b>	MAY	[rfc2911] §4.3.17.1	§9.2.25
<b>[job-]k-octets-processed</b>	integer(0:MAX)	<b>y</b>	<b>y</b>	MAY	[rfc2911] §4.3.18.1	§9.2.26
<b>job-mandatory-attributes</b>	1setOf type2 keyword	<b>⇒y</b>	-	MUST	<b>§Error! Reference source not found.</b>	-
<b>[job-]media-sheets</b>	integer(0:MAX)	<b>⇒y</b>	<b>⇒y</b>	MAY	[rfc2911] §4.3.17.3	§9.2.27
<b>[job-]media-sheets-completed</b>	integer(0:MAX)	<b>y</b>	<b>y</b>	MAY	[rfc2911] §4.3.18.3	§9.2.28
<b>job-message-from-operator</b>	text(127)	<b>y</b>	- <sup>44</sup>	MAY	[rfc2911] §4.3.16	-
<b>[job-]more-info</b>	uri	<b>y</b>	<b>y</b>	MAY	[rfc2911] §4.3.4	§9.2.29
<b>job-name(r/w)</b>	name(MAX)	<b>⇒y</b>	- <sup>45</sup>	MUST	[rfc2911] §4.3.5	-
<b>job-originating-user-name</b>	name (MAX)	<b>y</b>	-	MUST	[rfc2911] §4.3.6	-
<b>job-password</b>	octetString(255)	<b>⇒y</b>	-	MAY	[ippsave] §6.2	-
<b>job-password-encryption</b>	type3 keyword   name(MAX)	<b>⇒y</b>	-	MAY	[ippsave] §6.3	-
<b>job-printer-make-and-model</b>	text(127)	<b>y</b>	-	CMUST <sup>46</sup>	[ippsave] §6.1	-
<b>[job-]printer-up-time</b>	integer (1:MAX)	<b>y</b>	<b>y</b>	MUST	[rfc2911] §4.3.14.4	§9.2.30
<b>job-printer-uri</b>	uri	<b>⇒<sup>47</sup>y</b>	-	MUST	[rfc2911] §4.3.3	-
<b>job-state</b>	type1 enum	<b>y</b>	- <sup>48</sup>	MUST	[rfc2911] §4.3.7	-
<b>job-state-message</b>	text(MAX)	<b>y</b>	- <sup>49</sup>	MAY	[rfc2911] §4.3.9	-
<b>job-state-reasons</b>	1setOf type2 keyword	<b>y</b>	- <sup>50</sup>	MUST	[rfc2911] §4.3.8	-
<b>job-uri</b>	uri	<b>y</b>	-	MUST	[rfc2911] §4.3.1	-
<b>[job-]warnings-count</b>	integer(0:MAX)	<b>y</b>	<b>y</b>	MAY	[pwg5100.4] §6.1	<b>§Error! Referen ce source not found.</b>
<b>last-document</b>	boolean	-	<b>⇒y</b>	MAY	[rfc2911] §4.3.12	§9.2.31
<b>number-of-documents</b>	integer(0:MAX)	<b>y</b>	-	MAY	[rfc2911] §4.3.15	-
<b>number-of-intervening-jobs</b>	integer(0:MAX)	<b>y</b>	-	MAY	[rfc2911] §4.3.13	-

<sup>44</sup> The “job-message-from-operator” Job Description attribute has no corresponding “document-message-from-operator” (text(127)) Document Description attribute. Instead, both the user and the operator use the “document-message” (text(127)) operation/Document Description attribute (see section 9.2.11) to communicate with each other.

<sup>45</sup> The Document Description attribute that corresponds to the “job-name” Job Description attribute is the (existing) “document-name” attribute defined in [rfc2911].

<sup>46</sup> The Printer MUST support the “job-printer-make-and-model” Job Description attribute if the “job-save-disposition” Job Template attribute is supported.

<sup>47</sup> The Printer sets the “job-printer-uri” Job Description attribute from the “printer-uri” Operation attribute.

<sup>48</sup> The Document Description attribute that corresponds to the “job-state” Job Description attribute is the (new) “document-state” attribute.

<sup>49</sup> The Document Description attribute that corresponds to the “job-state-message” Job Description attribute is the (new) “document-state-message” attribute.

<sup>50</sup> The Document Description attribute that corresponds to the “job-state-reasons” Job Description attribute is the (new) “document-state-reasons” attribute.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
<b>output-device-requested</b>	name(127)	y	-	MAY	[this spec] § <b>Error!</b> <b>Reference source</b> <b>not found.</b>	-
<b>output-device-assigned</b>	name(127)	y	y	MAY	[rfc2911] §4.3.7.2	§9.2.32
<b>sheet-completed-copy-number</b>	integer(0:MAX)	y	y	MAY	[rfc3381] §4.2	§9.2.33
<b>sheet-completed-document-number</b>	integer(0:MAX)	y	-	MAY	[rfc3381] §4.3	-
<b>time-at-completed</b>	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.3	§9.2.34
<b>time-at-creation</b>	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.1	§9.2.35
<b>time-at-processing</b>	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.2	§9.2.36

"y", "⇒y", "-": See the description in the Legend before the table.

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

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

## 9.1 Job Description attributes

This sub-section contains the Job Description attributes that are not defined in any other specification.

### 9.1.1 ipp-attribute-fidelity (boolean)

This REQUIRED Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation attribute ([rfc2911] section 3.2.1.1)<sup>51</sup> that the client supplied in the Job Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation and Document Creation operations have been accepted. However, this attribute does provide an audit capability to the user and service desk for comparing

## 9.2 Document Description attributes

This section contains *all* of the Document Description attributes for use with the Document object. Most of these definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the semantics of each Document Description attribute only applies to the Document object containing the Document Description attribute. The Printer MAY support changing these Document Description attributes with the Set-Document-Attributes operation (see section 4.6), but only if indicated explicitly in this section.

<sup>51</sup> The "ipp-attribute-fidelity" attribute is defined only as an Operation attribute in [rfc2911]. This specification is defining it as a Document Description attribute as well which the Printer MUST support.

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

### 1524 **9.2.1 attributes-charset (charset)**

1525 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
1526 attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute  
1527 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section  
1528 4.1).

### 1529 **9.2.2 attributes-natural-language (naturalLanguage)**

1530 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
1531 attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description attribute  
1532 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section  
1533 4.1).

### 1534 **9.2.3 compression (type3 keyword)**

1535 This REQUIRED Document Description attribute specifies the compression used to represent this document (see  
1536 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute  
1537 supplied by the client in the Document Creation operation (see section 4.1).

### 1538 **9.2.4 current-page-order (type2 keyword)**

1539 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1540 attribute (see [pwg5100.3] §4.1) applied to the Document object.

### 1541 **9.2.5 date-time-at-completed (dateTime)**

1542 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1543 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

### 1544 **9.2.6 date-time-at-creation (dateTime)**

1545 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1546 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

### 1547 **9.2.7 date-time-at-processing (dateTime)**

1548 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1549 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

### 1550 **9.2.8 document-format (mimeMediaType)**

1551 This REQUIRED<sup>52</sup> Document Description attribute specified the document format of the Document Object content.  
1552 The Printer sets this Document Description attribute from the corresponding "document-format" Operation attribute  
1553 (see section 7.2.2 for the semantics), if supplied by the client in the Document Creation operation (see section 4.1).

---

<sup>52</sup> [rfc2911] did not define a "document-format" Document Description attribute; it is a new attribute defined in this specification.

1554 **9.2.9 document-job-id (integer(1:MAX))**

1555 This REQUIRED Document Description attribute is a *copy* of the Job's "job-id" Job Description attribute (see  
1556 [rfc2911] §4.3.2), i.e., the "job-id" of the Job containing this Document.

1557 **9.2.10 document-job-uri (uri)**

1558 This REQUIRED Document Description attribute is a *copy* of the Job's "job-uri" Job Description attribute (see  
1559 [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:  
1560 ipp://www.company.com/printers/myprinter/jobs/22

1561 **9.2.11 document-message (text(MAX))**

1562 This OPTIONAL Document Description contains a message from either (1) the user to the operator about the  
1563 Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the  
1564 reasons for modification or other management action taken on the Document. The Printer populates this Document  
1565 Description attribute from the "document-message" (text(MAX)) Operation attribute value supplied by the client in any  
1566 of the Document Creation operations (see section 4.1.1) or in a Cancel-Document operation (see section 4.7).

1567 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-  
1568 Document-Attributes operation (see section 4.6).

1569 **9.2.12 document-name (name(MAX))**

1570 This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1). The  
1571 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in  
1572 the Document Creation operation (see section 4.1).

1573 This attribute may be modified by a client using the Set-Document-Attributes operation (see section 4.6).

1574 **9.2.13 document-natural-language (naturalLanguage)**

1575 This OPTIONAL Document Description attribute specifies the natural language of the Document Object content. The  
1576 Printer sets this Document Description attribute from the corresponding "document-natural-language" Operation  
1577 attribute (section 7.2.3 for the semantics), if supplied by the client in the Document Creation operation (see section  
1578 4.1). If a Printer supports the "document-natural-language" Operation attribute, the Printer MUST support this  
1579 "document-natural-language" Document Description attribute.

1580 **9.2.14 document-number (integer(1:MAX))**

1581 This REQUIRED Document Description attribute is the ordinal number of the document within the job which  
1582 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically  
1583 increasing from 1 for each job.

1584 **9.2.15 document-printer-uri (uri)**

1585 This REQUIRED Document Description attribute is a *copy* of the "printer-uri" Operation attribute (see [rfc2911]  
1586 §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document. Example:  
1587 ipp://www.company.com/printers/myprinter.

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

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

Table 12 lists the "job-state" and "document-state" attribute values.

Table 12 - "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

The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state" attributes or just the "job-state" attribute as indicated in Table 12. Standard enum values are:

Value	Symbolic Name and Description
'3'	<b>'pending'</b> (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'	<b>'pending-held'</b> (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'	<b>'processing'</b> (JD): One or more of:  <ol style="list-style-type: none"><li>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.,</li><li>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.,</li><li>3. The Printer has made the job ready for printing, but the output device is not yet printing it, either because the job hasn't reached the output device or because the job is queued in the output device or some other spooler, awaiting the output device to print it.</li></ol>

When the job is in the 'processing' state, the entire job/document state includes the detailed status represented in the Printer'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.

Value	Symbolic Name and Description
	Implementations MAY 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.
'6'	<b>'processing-stopped'</b> (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'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.
'7'	<b>'canceled'</b> (JD): The job/document has been canceled by a Cancel-Job/Cancel-Document operation and the Printer has completed canceling the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer 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'	<b>'aborted'</b> (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 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'	<b>'completed'</b> (JD): The job/document has completed successfully or with warnings or errors after processing and all of the job/document media sheets have been successfully stacked in the appropriate output bin(s) and all job/document status attributes have reached their final values for the job/document. The job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.

1599    The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the  
1600    job/document altogether. The length of time that jobs/document remain in the 'canceled', 'aborted', and 'completed'  
1601    states depends on implementation.

1602    Jobs/documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the jobs/documents  
1603    have completed all activity, including stacking output media, after the jobs/documents have completed all activity,  
1604    and all job/document status attributes have reached their final values for the job/document.



9.2.16.1 The “job-state” Job Description attribute and the Job Life Cycle

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

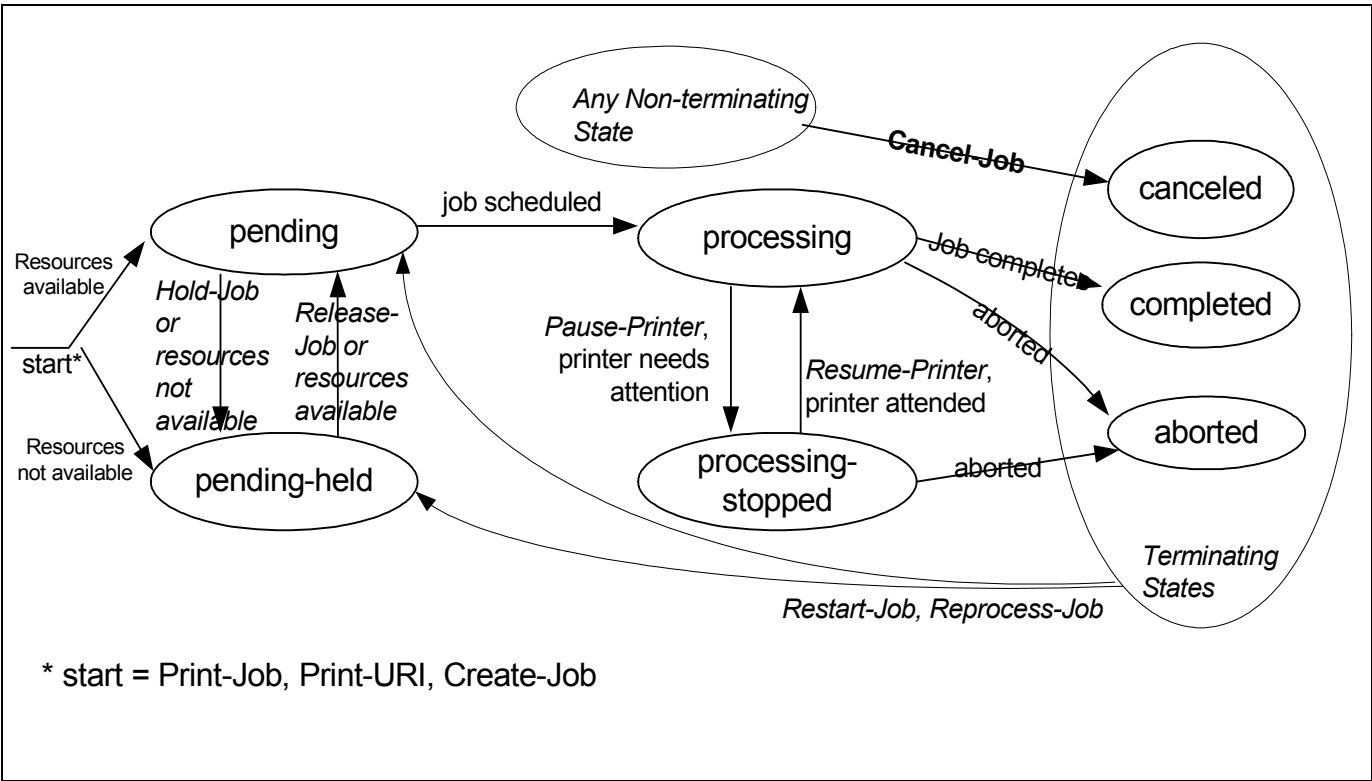


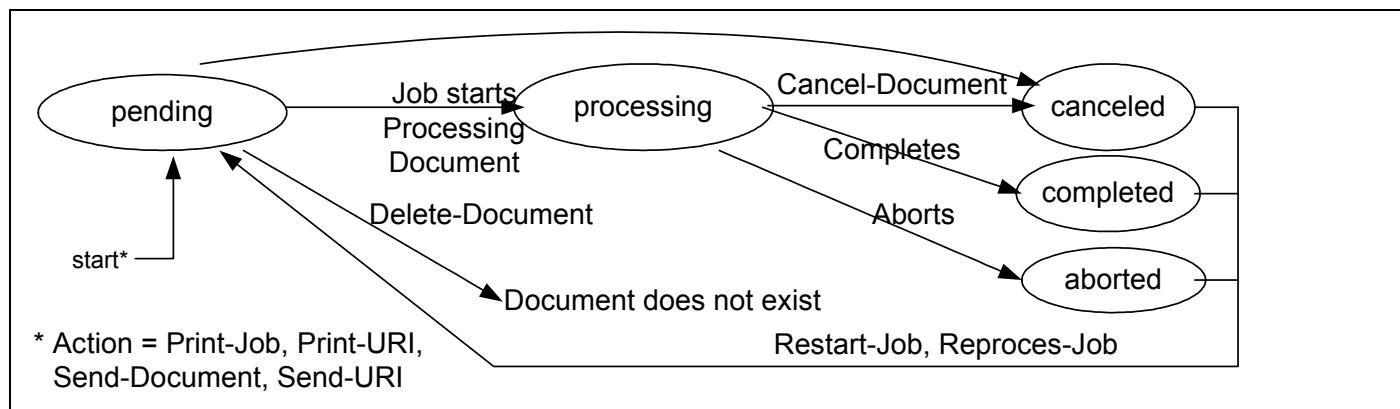
Figure 1 - The “job-state” Job Description attribute and the Job object life cycle

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

9.2.16.2 The “document-state” Document Description attribute and the Document object life Cycle

The “document-state” attribute is one of the most important Document Description attributes. Figure 2 shows the values of the “document-state” attribute and the Document object life cycle as affected by actions on the Job, Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the lifecycle of a Job<sup>53</sup>. Documents basically have three states. The first is waiting to be processed by a Job (i.e. pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed, canceled, or aborted).

<sup>53</sup> The Document object is not really a sub-job. If the Document object were its own independent active object, i.e., were a sub-job, then the Document state would affect the job state and there would be complex and debatable roll-up rules for how the various “document-state” values of all of the Job’s document are rolled up to give a single value for the Job’s “job-state” attribute. Instead, the Job state reflects the overall processing of the job and is the same whether or not the Document object is supported.



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

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

### 9.2.16.3 Forwarding Servers

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

### 9.2.16.4 Partitioning of Job/Document States

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

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

**Job Retention:** When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP Printer MAY "retain" the job in a restartable condition for an implementation-defined time period. This time period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see section 9.2.18) during the Job Retention phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-Documents operations MUST be supported while the job is in the Job Retention phase.

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

1654 **Job Removal:** After the job has remained in the Job History for an implementation-defined time, such as when the  
 1655 number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer  
 1656 removes the Job and Document objects from the system.

1657 Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" Operation  
 1658 attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-  
 1659 Documents operation and supplying the 'completed' value for the "which-jobs" Operation attribute, a client is  
 1660 requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-  
 1661 Document-Attributes operation, a client is requesting a job/documents in any phase except Job Removal. After Job  
 1662 Removal, the Get-Job-Attributes/Get-Documents-Attributes and Get-Jobs/Get-Documents operations no longer are  
 1663 capable of returning any information about a job/document.

1664 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

### 1665 **9.2.17 document-state-message (text(MAX)) and job-state-message (text(MAX))**

1666 This OPTIONAL Document Description attribute specifies information about the "job-state"/"document-state" and  
 1667 "job-state-reasons"/"document-state-reasons" attributes in human readable text. If the Printer supports this attribute,  
 1668 the Printer MUST be able to generate this message in any of the natural languages identified by the Printer's  
 1669 "generated-natural-language-supported" attribute (see the "attributes-natural-language" Operation attribute specified  
 1670 in [rfc2911] Section 3.1.4.1).

1671 The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-  
 1672 reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the  
 1673 (localized text). For such additional information such as interpreter errors for application program consumption or  
 1674 specific document access errors, new attributes with keyword values, needs to be developed and registered.

### 1675 **9.2.18 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2 1676 keyword)**

1677 The REQUIRED "job-state-reasons" and the REQUIRED "document-state-reasons" Document Description attributes  
 1678 provide additional information about the job's and each document's current state, i.e., information that augments the  
 1679 value of the job's "job-state" attribute and each Document's "document-state" attribute, respectively. The Printer  
 1680 SHOULD support the same values for both the "job-state-reasons" and the "document-state-reasons" attribute for  
 1681 those attributes that are defined for both as indicated in the "Job" and "Doc" columns in Table 13.

1682 These values MAY be used with any job or document state or states for which the reason makes sense. Some of  
 1683 these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when  
 1684 implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the  
 1685 reason no longer applies whether the value of the Job's "job-state" attribute or the Document's "document-state"  
 1686 attribute changed or not. When the Job or Document does not have any reasons for being in its current state, the  
 1687 value of the Job's "job-state-reasons" attribute or Document's "document-state-reasons" attribute MUST be 'none'.

1688 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-  
 1689 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document  
 1690 objects are passive objects operated on by the containing Job object.

1691 Note: While values cannot be added to the "job-state" or "document-state" attributes without impacting deployed  
 1692 clients that take actions upon receiving "job-state" or "document-state" values, it is the intent that additional "job-  
 1693 state-reasons" and "document-state-reasons" values can be defined and registered without impacting such deployed  
 1694 clients. In other words, the "job-state-reasons" and the "document-state-reasons" attributes are intended to be  
 1695 extensible.

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

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

#### Notation:

[job-] indicates a state reason keyword value that has the ‘job-’ prefix when it is a value of the “job-state-reasons” attribute, but does not have the ‘job-’ prefix when it is a value of the “document-state-reasons” attribute<sup>54</sup>. For purposes of sorting in Table 13, the “[job-]” prefix is observed, since this is an IPP specification.  
 “-” indicates that the Job or Document value is *not* defined.

**Table 13 - “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
<b>job-state-reasons</b>	1setOf type2 keyword	y	- <sup>55</sup>	MUST	[rfc2911] §4.3.8
<b>document-state-reasons</b>	1setOf type2 keyword	-	y	MUST	9.2.18
	aborted-by-system	y	y	MAY	[rfc2911] §4.3.8
	compression-error	y	y	MAY	[rfc2911] §4.3.8
	document-access-error	y	y	MAY	[rfc2911] §4.3.8
	document-format-error	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-at-device	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-operator	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-user	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-successfully	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-with-errors	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-with-warnings	y	y	MAY	[rfc2911] §4.3.8
	job-data-insufficient	y	-	MAY	[rfc2911] §4.3.8
	job-hold-until-specified	y	-	MAY	[rfc2911] §4.3.8
	[job-]incoming	y	y	MAY	[rfc2911] §4.3.8
	[job-]interpreting	y	y	MAY	[rfc2911] §4.3.8
	[job-]outgoing	y	y	MAY	[rfc2911] §4.3.8
	job-password-wait	y	-	MAY	[ippsave] §8.3.1
	[job-]printing	y	y	MAY	[rfc2911] §4.3.8
	[job-]queued	y	y	MAY	[rfc2911] §4.3.8
	[job-]queued-for-marker	y	y	MAY	[rfc2911] §4.3.8
	job-restartable	y	-	MAY	[rfc2911] §4.3.8
	job-resuming	y	-	MAY	[ippsave] §8.3.1

<sup>54</sup> 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.

<sup>55</sup> 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-saved-successfully	y	-	MAY	[ippsave] §8.3.1
	job-save-error	y	-	MAY	[ippsave] §8.3.1
	job-saving	y	-	MAY	[ippsave] §8.3.1
	job-scheduling	y	-	MAY	[ippsave] §8.3.1
	[job-]spooling	y	y	MAY	[ippsave] §8.3.1
	[job-]streaming	y	y	MAY	[ippsave] §8.3.1
	job-suspended	y	-	MAY	[adm-ops] §9.1
	job-suspended-by-operator	y	-	MAY	[ippsave] §8.3.1
	job-suspended-by-system	y	-	MAY	[ippsave] §8.3.1
	job-suspended-by-user	y	-	MAY	[ippsave] §8.3.1
	job-suspending	y	-	MAY	[ippsave] §8.3.1
	[job-]transforming	y	y	MAY	[rfc2911] §4.3.8
	none	y	y	MUST	[rfc2911] §4.3.8
	printer-stopped	y	-	MAY	[rfc2911] §4.3.8
	printer-stopped-partly	y	-	MAY	[rfc2911] §4.3.8
	processing-to-stop-point	y	-	MAY	[rfc2911] §4.3.8
	proof-print-wait	y	-	MAY	[ippsave] §8.3.1
	queued-in-device	y	y	MAY	[rfc2911] §4.3.8
	resources-are-not-ready	y	-	MAY	[rfc2911] §4.3.8
	resources-are-not-supported	y	y	MAY	[pwg5100.3] §6.1
	service-off-line	y	-	MAY	[rfc2911] §4.3.8
	submission-interrupted	y	y	MAY	[rfc2911] §4.3.8
	unsupported-compression	y	y	MUST	[rfc2911] §4.3.8
	unsupported-document-format	y	y	MUST	[rfc2911] §4.3.8

For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely to occur (if implemented), starting with the 'none' value. Note: The order is improved over that in [rfc2911]. The (JD), (J), and (D) notation is identical to the "Job" and "Doc" columns in Table 13 indicating whether the keyword is defined for the "job-state-reasons" and/or "document-state-reasons" attributes:

- 'none' (JD):** There are no reasons for the job's or document's current state. This state reason is semantically equivalent to "job-state-reasons" or "document-state-reasons" attribute without any value and MUST be used when there is no other value, since the 1setOf attribute syntax requires at least one value. [rfc2911] §4.3.8
- 'job-hold-until-specified' (J):** The value of the job's "job-hold-until" attribute was specified with a time period that is still in the future. The job MUST NOT be a candidate for processing until this reason is removed and there are no other reasons to hold the job. This value SHOULD be supported if the "job-hold-until" Job Template attribute is supported. [rfc2911] §4.3.8
- 'job-password-wait' (J):** The Job is currently being held until the correct password is entered at the device. If the "job-password" (octetString(255)) Operation attribute (See [ippsave] section 4.1) is supported, this value MUST be supported. [ippsave] §8.3.1
- 'proof-print-wait' (J):** The job is currently being held until the operator verifies the output of the proof print and performs a Release-Job operation. If the "proof-print" (collection) Job Template attribute (See [ippsave] section 5.9) is supported, this value MUST be supported. [ippsave] §8.3.1
- 'resources-are-not-supported' (JD):** At least one of the resources needed by the job/document, such as media, fonts, resource objects, etc., is not supported on any of the physical printers for which the job/document is a candidate. This condition MAY be detected when the job/document is accepted,



or subsequently while the job/document is pending or processing, depending on implementation. The job/document may (1) remain in its current state, (2) be moved to the 'pending-held' state, depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer is put into the 'stopped' state when the job/document is attempted to be processed on the Printer. This value is intended for use with an implementation that supports the "user-defined-values-supported" Printer attribute (see [pwg5100.3] section 6.1) which allows a job to be accepted with an unsupported 'name' value. [pwg5100.3] §6.1

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

**'[job-]incoming' (JD):** Either (1) the Printer has accepted the Create-Job operation and is expecting additional Send-Document and/or Send-URI operations or (2) the Printer is retrieving/accepting document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation. [rfc2911] §4.3.8

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

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

**'job-data-insufficient' (J):** The Create-Job operation has been accepted by the Printer, but the Printer is expecting additional document data before it can move the job into the 'processing' state. If a Printer starts processing before it has received all data, the Printer removes the 'job-data-insufficient' reason, but the 'job-incoming' remains. If a Printer starts processing after it has received all data, the Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same time. [rfc2911] §4.3.8

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

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

**'document-access-error' (JD):** After accepting a Print-URI or Send-URI request, the Printer could not access one or more documents passed by reference. This reason is intended to cover any file access problem, including file does not exist and access denied because of an access control problem. The Printer MAY also indicate the document access error using the "job-document-access-errors" Job Description attribute (see the description of "job-document-access-errors" above). Whether the Printer aborts the job/document and moves the job/document to the 'aborted' job state or prints all documents that are accessible and moves the job/document to the 'completed' job/document state and adds the 'completed-with-errors' value in the job's "job-state-reasons" or document's "document-state-reasons" attribute depends on implementation and/or site policy. This value SHOULD be supported if the Print-URI or Send-URI operations are supported. [rfc2911] §4.3.8



- 1783 **'unsupported-document-format' (JD):** The job/document was aborted by the system because the  
1784 document-data's document-format is not among those supported by the Printer. If the client  
1785 specifies the document-format as 'application/octet-stream', the printer MAY abort the job/document  
1786 and post this reason even though the format is a member of the "document-format-supported" printer  
1787 attribute, but not among the auto-sensed document-formats. This value MUST be supported, since  
1788 "document-format" is a REQUIRED Operation attribute. [rfc2911] §4.3.8
- 1789 **'document-format-error' (JD):** The job/document was aborted by the system because the Printer  
1790 encountered an error in the document-data while processing it. If the Printer posts this reason, the  
1791 document-data has already passed any tests that would have led to the 'unsupported-document-  
1792 format' job-state-reason/document-state-reason. [rfc2911] §4.3.8
- 1793 **'submission-interrupted' (JD):** The job or document was not completely submitted for some unforeseen  
1794 reason, such as: (1) the Printer has crashed before the job was closed by the client, (2) the Printer or  
1795 the document transfer method has crashed in some non-recoverable way before the document data  
1796 was entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-  
1797 out period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911]  
1798 Section 4.4.31. [rfc2911] §4.3.8
- 1799 **'[job]-outgoing' (JD):** The Printer is transmitting the job/document to the output device. [rfc2911] §4.3.8
- 1800 **'job-scheduling' (J):** The printer is in the process of scheduling the processing for the Job. [ippsave] §8.3.1
- 1801 **'[job]-queued' (JD):** Job is in the 'processing' state, but more specifically, the Printer has queued the  
1802 Document data. [rfc2911] §4.3.8
- 1803 **'[job]-transforming' (JD):** Job/document is in the 'processing' state, but more specifically, the Printer is  
1804 interpreting document data and producing another electronic representation. [ippsave] §8.3.1
- 1805 **'[job]-interpreting' (JD):** Job/document is in the 'processing' state, but more specifically, the Printer is  
1806 interpreting the document data. [rfc2911] §4.3.8
- 1807 **'[job]-queued-for-marker' (JD):** Job/document is in any of the 'pending-held', 'pending', or 'processing'  
1808 states, but more specifically, the Printer has completed enough processing of the document to be  
1809 able to start marking and the job/document is waiting for the marker. Systems that require human  
1810 intervention to release jobs using the Release-Job operation, put the job into the 'pending-held' job  
1811 state. Systems that automatically select a job to use the marker put the job into the 'pending' job  
1812 state or keep the job in the 'processing' job state while waiting for the marker, depending on  
1813 implementation. All implementations put the job/document into (or back into) the 'processing' state  
1814 when marking does begin. [rfc2911] §4.3.8
- 1815 **'[job]-printing' (JD):** The output device is marking media. This value is useful for Printers which spend a  
1816 great deal of time processing (1) when no marking is happening and then want to show that marking  
1817 is now happening or (2) when the job/document is in the process of being canceled or aborted while  
1818 the job/document remains in the 'processing' state, but the marking has not yet stopped so that  
1819 impression or sheet counts are still increasing for the job/document. [rfc2911] §4.3.8
- 1820 **'printer-stopped-partly' (J):** The value of the Printer's "printer-state-reasons" attribute contains the value  
1821 'stopped-partly'. [rfc2911] §4.3.8
- 1822 **'printer-stopped' (J):** The value of the Printer's "printer-state" attribute is 'stopped'. [rfc2911] §4.3.8
- 1823 **'job-suspending' (J):** The printer is in the process of moving the Job from a processing condition to a  
1824 suspended condition where other jobs can be processed. [ippsave] §8.3.1
- 1825 **'job-suspended' (J):** The job has been suspended while processing using the Suspend-Current-Job  
1826 operation and other jobs can be processed on the Printer. The Job can be resumed using the  
1827 Resume-Job operation which removes this value. Note: Documents cannot be suspended and there  
1828 is no Suspend-Current-Documents operation. [adm-ops] §9.1
- 1829 **'job-suspended-by-operator' (J):** The Job has been indefinitely suspended by the printer operator.  
1830 [ippsave] §8.3.1

- 1831 **'job-suspended-by-user' (J)**: The Job has been indefinitely suspended by the user. [ippsave] §8.3.1
- 1832 **'job-suspended-by-system' (J)**: The Job has been indefinitely suspended by the Printer's system software
- 1833 during normal processing of the job. [ippsave] §8.3.1
- 1834 **'job-resuming' (J)**: The printer is in the process of moving the Job from a suspended condition to become a
- 1835 candidate for processing. [ippsave] §8.3.1
- 1836 **'[job]-canceled-by-user' (JD)**: The job/document was canceled by the owner of the job using the Cancel-
- 1837 Job/Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value
- 1838 of the originating user that created the Job object, or by some other authorized end-user, such as a
- 1839 member of the job owner's security group. This 'job-canceled' value SHOULD be supported. The
- 1840 'canceled-by-user' value SHOULD be supported for the "document-state-reasons" attributes for use
- 1841 with the Cancel-Document. [rfc2911] §4.3.8
- 1842 **'[job]-canceled-by-operator' (JD)**: The job/document was canceled by the operator using the Cancel-
- 1843 Job/Cancel-Document request, i.e., by a user who has been authenticated as having operator
- 1844 privileges (whether local or remote). If the security policy is to allow anyone to cancel anyone's
- 1845 job/document, then these values may be used when the job/document is canceled by other than the
- 1846 owner of the job. For such a security policy, in effect, everyone is an operator as far as canceling
- 1847 jobs/documents is concerned. These values SHOULD be supported if the implementation permits
- 1848 canceling by other than the owner of the job. [rfc2911] §4.3.8
- 1849 **'[job]-canceled-at-device' (JD)**: The job/document was canceled by an unidentified local user, i.e., a user
- 1850 at a console at the device. This value SHOULD be supported if the implementation supports
- 1851 canceling jobs/documents at the console. [rfc2911] §4.3.8
- 1852 **'aborted-by-system' (JD)**: The job/document (1) is in the process of being aborted, (2) has been aborted by
- 1853 the system and placed in the 'aborted' state, or (3) has been aborted by the system and placed in the
- 1854 'pending-held' state, so that a user or operator can manually try the job/document again. This value
- 1855 SHOULD be supported. [rfc2911] §4.3.8
- 1856 **'processing-to-stop-point' (J)**: The requester has issued a Cancel-Job/Cancel-Document operation or the
- 1857 Printer has aborted the job/document, but is still performing some actions on the job/document until a
- 1858 specified stop point occurs or job/document termination/cleanup is completed.
- 1859 If the implementation requires some measurable time to cancel the job/document in the 'processing'
- 1860 or 'processing-stopped' job/document states, the Printer MUST use this value to indicate that the
- 1861 Printer is still performing some actions on the job/document while the job/document remains in the
- 1862 'processing' or 'processing-stopped' state. After all the job's/document's job/document description
- 1863 attributes have stopped incrementing, the Printer moves the job/document from the 'processing' state
- 1864 to the 'canceled' or 'aborted' job/document states. [rfc2911] §4.3.8
- 1865 **'service-off-line' (J)**: The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the
- 1866 'pending-held' state. This situation could be true if the service's or document transform's input is
- 1867 impaired or broken. [rfc2911] §4.3.8
- 1868 **'[job]-completed-successfully' (JD)**: The job/document completed successfully. There were no warnings
- 1869 or errors in printing. This value SHOULD be supported. [rfc2911] §4.3.8
- 1870 **'[job]-completed-with-warnings' (JD)**: The print part of the job/document completed with warnings
- 1871 (whether or not there were save errors). This value SHOULD be supported if the implementation
- 1872 detects warnings. [rfc2911] §4.3.8
- 1873 **'[job]-completed-with-errors' (JD)**: The print part of the job/document completed with errors (and possibly
- 1874 warnings too) (whether or not there were save errors). This value SHOULD be supported if the
- 1875 implementation detects errors. [rfc2911] §4.3.8
- 1876 **'job-saving' (J)**: The Printer is transmitting the Job to the save location. This is similar to the 'job-printing'
- 1877 value. [ippsave] §8.3.1
- 1878 **'job-saved-successfully' (J)**: The Printer saved the Job successfully. [ippsave] §8.3.1

1879 **'job-save-error' (J):** The Printer did not save the Job successfully (whether or not it was printed successfully,  
 1880 printed with warnings, printed with errors, or not printed). The Printer MUST ensure that none of the  
 1881 saved job is accessible, if it was unable to successfully save all of the job. [ippsave] §8.3.1

1882 **'job-restartable' (J):** This job is retained (see the description of "job-state" above, specifically "Partitioning of  
 1883 Job States") and is currently able to be restarted using the Restart-Job operation (see [rfc2911]  
 1884 Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer  
 1885 MUST accept a Restart-Job operation for that job. This value SHOULD be supported if the Restart-  
 1886 Job operation is supported. [rfc2911] §4.3.8

1887 **'queued-in-device' (JD):** The job/document has been forwarded to a device or print system that is unable to  
 1888 send back status. The Printer sets the job's/document's "job-state" / "document-state" attribute to  
 1889 'completed' and adds the 'queued-in-device' value to the job's/document's "job-state-reasons" /  
 1890 "document-state-reasons" attribute to indicate that the Printer has no additional information about the  
 1891 job/document and never will have any better information. See the description of the "job-state" /  
 1892 "document-state" attribute above, specifically the portion on "Forwarding Servers". [rfc2911] §4.3.8

1893 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

### 1894 **9.2.19 document-uri (uri)**

1895 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a  
 1896 Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the  
 1897 Send-URI operation (see section 4.4).

### 1898 **9.2.20 impressions-completed-current-copy (integer(0:MAX))**

1899 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
 1900 attribute (see [rfc3381] §4.4) applied to the Document object.

### 1901 **9.2.21 [job-]detailed-status-message (1setOf text(MAX))**

1902 This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the  
 1903 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.10) applied to the  
 1904 Document object.

### 1905 **9.2.22 [job-]document-access-errors (1setOf text(MAX))**

1906 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the  
 1907 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.11) applied to the  
 1908 Document object.

### 1909 **9.2.23 [job-]impressions (integer(0:MAX))**

1910 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-  
 1911 impressions" Job Description attribute (see [rfc2911] §4.3.17.2) applied to the Document object. The Printer sets  
 1912 this Document Description attribute from the corresponding Operation attribute supplied by the client in the  
 1913 Document Creation operation (see section 4.1).

### 1914 **9.2.24 [job-]impressions-completed (integer(0:MAX))**

1915 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the  
 1916 corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] §4.3.18.2) applied to the  
 1917 Document object.

1918 **9.2.25 [job-]k-octets (integer(0:MAX))**

1919 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-  
1920 octets" Job Description attribute (see [rfc2911] §4.3.17.1) applied to the Document object. The Printer sets this  
1921 Document Description attribute from the corresponding Operation attribute supplied by the client in the Document  
1922 Creation operation (see section 4.1).

1923 **9.2.26 [job-]k-octets-processed (integer(0:MAX))**

1924 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding  
1925 "job-k-octets-processed" Job Description attribute (see [rfc2911] §4.3.18.1) applied to the Document object.

1926 **9.2.27 [job-]media-sheets (integer(0:MAX))**

1927 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-  
1928 media-sheets" Job Description attribute (see [rfc2911] §4.3.17.3) applied to the Document object. The Printer sets  
1929 this Document Description attribute from the corresponding Operation attribute supplied by the client in the  
1930 Document Creation operation (see section 4.1).

1931 **9.2.28 [job-]media-sheets-completed (integer(0:MAX))**

1932 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-  
1933 media-sheets-completed" Job Description attribute (see [rfc2911] §4.3.18.3) applied to the Document object.

1934 **9.2.29 [job-]more-info (uri)**

1935 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-  
1936 more-info" Job Description attribute (see [rfc2911] §4.3.4) applied to the Document object.

1937 **9.2.30 [job-]printer-up-time (integer (1:MAX))**

1938 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the  
1939 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description  
1940 attribute (see [rfc2911] section 4.4.29).

1941 A client MAY request this attribute in a Get-Documents request and use the value  
1942 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes  
1943 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of  
1944 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-  
1945 xxx" event occurred by subtracting this difference from the client's wall-clock time.

1946 **9.2.31 last-document (boolean)**

1947 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the  
1948 Job. See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation  
1949 attribute supplied by the client in the Document Creation operation (see section 4.1).

1950 **9.2.32 output-device-assigned (name(127))**

1951 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1952 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

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

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

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

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

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

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

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

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

## 10 Printer attributes

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

Job Template attributes (JT)	<p>These Printer attributes are related directly to the “xxx” Job Template attributes that a client can supply in a Job Creation request as follows:</p> <ol style="list-style-type: none"> <li>1. “xxx-supported” indicate the supported values</li> <li>2. “xxx-default” indicate the values that will be used if the client and the PDL omit the attribute.</li> <li>3. “xxx-ready” indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as “media” and possibly “job-finishing”.</li> </ol> <p>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: “requested-attributes” = ‘job-template’.</p>
Document Template attributes (DT)	<p>These Printer attributes are related directly to the “xxx” Document Template attributes that a client can supply in a Document Creation request as follows:</p> <ol style="list-style-type: none"> <li>1. “xxx-supported” indicate the supported values</li> <li>2. “xxx-default” indicate the values that will be used if the client and the PDL omit the attribute.</li> <li>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”.</li> </ol> <p>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: “requested-attributes” = ‘document-template’.</p>
Printer Description attributes (PD)	<p>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.</p>
neither (-)	<p>These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.</p>



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

- "Attribute Syntax"** - indicates the attribute syntax (see [rfc2911] section 4.1). Many "xxx-default" and "xxx-supported" attributes have the 'collection' syntax which consists of a number of member attributes. These member attributes are not listed in this table when they are the same as the corresponding "xxx" attribute in Table 10. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.
- "Grp"** - indicates to which group the attribute belongs. "PD" = Printer Description; "JT" = Job Template as explained above.
- "Printer Conf."** - indicates the IPP/1.1 Printer conformance requirements for supporting the attribute. Those attributes labeled as "MAY" may have conditional requirements that require their support, if the Printer supports a related attribute, operation, or feature. For example, all Job Template attributes are OPTIONAL for a Printer to support. However, if a Printer supports Job Template attribute "xxx", then it MUST also support the corresponding "xxx-default" and "xxx-supported" attributes. Similarly, if Event Notification is supported, then some of the attributes indicated as "MAY" in this table become MUST.
- "Reference"** - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

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

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>attributes-charset-supported</b>	1setOf charset	PD	MUST	[this-spec] §10.1
<b>attributes-natural-language-supported</b>	1setOf naturalLanguage	PD	MUST	[this-spec] §10.2
<b>charset-configured</b>	charset	PD	MUST	[rfc2911] §4.4.17
<b>charset-supported</b>	1setOf charset	PD	MUST	[rfc2911] §4.4.18
<b>color-supported</b>	boolean	PD	MAY	[rfc2911] §4.4.26
<b>compression-supported</b>	type3 keyword	PD	MUST	[rfc2911] §4.4.32
<b>copies-default</b>	integer(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.5
<b>copies-supported</b>	rangeOfInteger(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.5
<b>cover-back-default</b>	collection	JT,DT	MAY	[pwg5100.3] §3.1.3
<b>cover-back-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
<b>cover-front-default</b>	collection	JT,DT	MAY	[pwg5100.3] §3.1.3
<b>cover-front-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
<b>cover-type-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.1.2.1
<b>document-creation-attributes-supported</b>	1setOf type2 keyword	PD	MUST	[this-spec] §10.3
<b>document-format-default</b>	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
<b>document-format-supported</b>	1setOf mimeMediaType	PD	MUST	[rfc2911] §4.4.22
<b>document-format-varying-attributes</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.3



Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>document-natural-language-default</b>	naturalLanguage	PD	MAY	[this-spec] § <b>Error!</b> <b>Reference source</b> <b>not found.</b>
<b>document-natural-language-supported</b>	1setOf naturalLanguage	PD	MAY	[this-spec] § <b>Error!</b> <b>Reference source</b> <b>not found.</b>
<b>feed-orientation-default</b>	type3 keyword	JT,DT	MAY	[ippsave] §5.1.1
<b>feed-orientation-supported</b>	1setOf type3 keyword	JT,DT	MAY	[ippsave] §5.1.2
<b>finishings-col-default</b>	collection	JT,DT	MAY	[pwg5100.3] §3.2.3
<b>finishings-col-ready</b>	1setOf collection	JT,DT	MAY	[pwg5100.3] §3.2.4
<b>finishings-col-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.2.5
<b>finishings-default</b>	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
<b>finishings-ready</b>	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
<b>finishings-supported</b>	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
<b>finishing-template-supported</b>	1setOf name(MAX)	-	MAY	[pwg5100.3] §3.2.1.1
<b>font-name-requested-default</b>	name(MAX)	JT,DT	MAY	[ippsave] §5.2.1
<b>font-name-requested-supported</b>	1setOf name(MAX)	JT,DT	MAY	[ippsave] §5.2.2
<b>font-size-requested-default</b>	integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
<b>font-size-requested-supported</b>	1setOf integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
<b>force-front-side-default</b>	1setOf integer(1:MAX)	JT,DT	MAY	[pwg5100.3] §3.3
<b>force-front-side-supported</b>	rangeOfInteger(1:MAX)	JT,DT	MAY	[pwg5100.3] §3.3
<b>generated-natural-language-supported</b>	1setOf naturalLanguage	PD	MUST	[rfc2911] §4.4.20
<b>imposition-template-default</b>	type3 keyword   name(MAX)	JT,DT	MAY	[pwg5100.3] §3.4
<b>imposition-template-supported</b>	1setOf (type3 keyword   name(MAX))	JT,DT	MAY	[pwg5100.3] §3.4
<b>insert-after-page-number-supported</b>	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.1.1
<b>insert-count-supported</b>	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.2.1
<b>insert-sheet-default</b>	1setOf collection	JT,DT	MAY	[pwg5100.3] §3.5.4
<b>insert-sheet-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.5.5
<b>ippget-event-life</b>	integer(15:MAX)	PD	MAY	[get-method] §8.1
<b>ipp-versions-supported</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.20
<b>job-account-id-default</b>	name(MAX)	JT	MAY	[pwg5100.3] §3.6
<b>job-account-id-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.6
<b>job-accounting-output-bin-default</b>	type3 keyword   name(MAX)	-	MAY	[pwg5100.3] §3.8.3.1
<b>job-accounting-output-bin-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.8.3.2
<b>job-accounting-sheets-default</b>	collection	JT	MAY	[pwg5100.3] §3.8.4
<b>job-accounting-sheets-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.8.5
<b>job-accounting-sheets-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.8.1.1
<b>job-accounting-user-id-default</b>	name(MAX)	JT	MAY	[pwg5100.3] §3.7
<b>job-accounting-user-id-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.7
<b>job-copies-default</b>	integer(1:MAX)	JT	MAY	[this-spec] § <b>Error!</b> <b>Reference source</b>

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
				<b>not found.</b>
<b>job-copies-supported</b>	reangeOfInteger(1:MAX)	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-cover-back-default</b>	collection	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-cover-back-supported</b>	1setOf type2 keyword	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-cover-front-default</b>	collection	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-cover-front-supported</b>	1setOf type2 keyword	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-creation-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[ippsave] §7.1
<b>job-error-sheet-default</b>	collection	JT	MAY	[pwg5100.3] §3.7
<b>job-error-sheet-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.9.5
<b>job-error-sheet-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.9.1.1
<b>job-error-sheet-when-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.9.2.1
<b>job-finishings-default</b>	1setOf type2 enum	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-finishings-supported</b>	1setOf type2 enum	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-finishings-col-default</b>	collection	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-finishings-col-supported</b>	1setOf type2 keyword	JT	MAY	[this-spec] §Error! <b>Reference source not found.</b>
<b>job-hold-until-default</b>	type3 keyword   name(MAX)	JT	MAY	[rfc2911] §4.2.2
<b>job-hold-until-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[rfc2911] §4.2.2
<b>job-impressions-supported</b>	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.34
<b>job-k-octets-supported</b>	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.33
<b>job-media-sheets-supported</b>	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.35
<b>job-message-to-operator-default</b>	text(MAX)	JT	MAY	[pwg5100.3] §3.12
<b>job-message-to-operator-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.12
<b>job-password-supported</b>	integer(0:127)	PD	MAY	[ippsave] §7.2
<b>job-password-encryption-supported</b>	1setOf (type3 keyword   name(MAX))	PD	MAY	[ippsave] §7.3
<b>job-priority-default</b>	integer(1:100)	JT	MAY	[rfc2911] §4.2.1
<b>job-priority-supported</b>	1setOf integer(1:100)	JT	MAY	[rfc2911] §4.2.1
<b>job-settable-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.2
<b>job-sheet-message-default</b>	text(MAX)	JT	MAY	[pwg5100.3] §3.12
<b>job-sheet-message-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.12

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>job-sheets-col-default</b>	collection	JT	MAY	[pwg5100.3] §3.11.3
<b>job-sheets-col-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.11.4
<b>job-sheets-default</b>	type3 keyword   name(MAX)	JT	MAY	[rfc2911] §4.2.3
<b>job-sheets-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[rfc2911] §4.2.3
<b>job-spooling-supported</b>	type2 keyword	PD	MAY	[ippsave] §7.4
<b>max-save-info-supported</b>	integer(1:MAX)	PD	MAY	[ippsave] §7.5
<b>max-stitching-locations-supported</b>	integer(1:MAX)	PD	MAY	[pwg5100.3] §5.2
<b>media-back-coating-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.10.2
<b>media-col-database</b>	1setOf collection	- <sup>56</sup>	MAY	[ippsave] §7.6
<i>any "media-col" member attribute</i>				
<b>media-col-default</b>	collection	JT	MAY	[pwg5100.3] §3.13.12
<i>any "media-col" member attribute</i>				
<b>media-color-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.13.4.1
<b>media-col-ready</b>	1setOf collection	JT	MAY	[pwg5100.3] §3.13.13
<i>any "media-col" member attribute</i>				
<b>media-col-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.13.14
<b>media-default</b>	type3 keyword   name(MAX)	JT,DT	MAY	[rfc2911] §4.2.11
<b>media-front-coating-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.10.1
<b>media-hole-count-supported</b>	1setOf rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.13.6.1
<b>media-info-supported</b>	boolean	-	MAY	[pwg5100.3] §3.13.3.1
<b>media-input-tray-check-default</b>	type3 keyword   name(MAX)	JT	MAY	[pwg5100.3] §3.14
<b>media-input-tray-check-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[pwg5100.3] §3.14
<b>media-key-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.1.1
<b>media-order-count-supported</b>	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.7.1
<b>media-pre-printed-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.5.1
<b>media-ready</b>	1setOf (type3 keyword   name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
<b>media-recycled-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.11.1
<b>media-size-supported</b>	1setOf collection	-	MAY	[pwg5100.3] §3.13.8.3
<b>media-supported</b>	1setOf (type3 keyword   name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
<b>media-weight-metric-supported</b>	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.9.1
<b>multiple-document-handling-default</b>	type2 keyword	JT	<b>MUST</b> <sup>57</sup>	[rfc2911] §4.2.4

<sup>56</sup> The Printer does not return the "media-col-database" attribute when the client requests 'all' or 'printer-description' attribute group because there MAY be a large number of values. Instead the client MUST query "media-col-database" explicitly in a Get-Printer-Attributes request.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>multiple-document-handling-supported</b>	1setOf type2 keyword	JT	<b>MUST</b> <sup>57</sup>	[rfc2911] §4.2.4
<b>multiple-document-jobs-supported</b>	boolean	PD	<b>MUST</b> <sup>57</sup>	[rfc2911] §4.4.16
<b>multiple-operation-time-out</b>	integer(1:MAX)	PD	<b>MUST</b> <sup>57</sup>	[rfc2911] §4.4.31
<b>natural-language-configured</b>	naturalLanguage	PD	<b>MUST</b>	[rfc2911] §4.4.19
<b>notify-attributes-supported</b>	1setOf type2 keyword	PD	<b>MAY</b>	[ntfy] §5.3.4
<b>notify-events-default</b>	1setOf type2 keyword	PD	<b>MAY</b>	[ntfy] §5.3.3
<b>notify-events-supported</b>	1setOf type2 keyword	PD	<b>MAY</b>	[ntfy] §5.3.3
<b>notify-lease-duration-default</b>	integer(0:67108863)	PD	<b>MAY</b>	[ntfy] §5.3.8
<b>notify-lease-duration-supported</b>	1setOf (integer(0: 67108863)   rangeOfInteger(0:67108863))	PD	<b>MAY</b>	[ntfy] §5.3.8
<b>notify-lease-expiration-time</b>	integer(0:MAX)	PD	<b>MAY</b>	[ntfy] §5.4.3
<b>notify-max-events-supported</b>	integer(2:MAX)	PD	<b>MAY</b>	[ntfy] §5.3.3
<b>notify-pull-method-supported</b>	1setOf type2 keyword	PD	<b>MAY</b>	[ntfy] §5.3.2
<b>notify-schemes-supported</b>	1setOf uriScheme	PD	<b>MAY</b>	[ntfy] §5.3.1
<b>number-up-default</b>	integer(1:MAX)	JT,DT	<b>MAY</b>	[rfc2911] §4.2.9
<b>number-up-supported</b>	1setOf (integer(1:MAX)   rangeOfInteger(1:MAX))	JT,DT	<b>MAY</b>	[rfc2911] §4.2.9
<b>operations-supported</b>	1setOf type2 enum	PD	<b>MUST</b>	[rfc2911] §4.4.15
<b>orientation-requested-default</b>	type2 enum	JT,DT	<b>MAY</b>	[rfc2911] §4.2.10
<b>orientation-requested-supported</b>	1setOf type2 enum	JT,DT	<b>MAY</b>	[rfc2911] §4.2.10
<b>output-bin-default</b>	type2 keyword   name(MAX)	JT	<b>MAY</b>	[pwg5100.2] §2.1
<b>output-bin-supported</b>	1setOf (type2 keyword   name(MAX))	JT	<b>MAY</b>	[pwg5100.2] §2.1
<b>page-delivery-default</b>	type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.3] §3.15
<b>page-delivery-supported</b>	1setOf type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.3] §3.15
<b>page-order-received-default</b>	type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.3] §3.16
<b>page-order-received-supported</b>	1setOf type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.3] §3.16
<b>page-overrides-supported</b>	1setOf type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.4] §5.2.9
<b>page-ranges-supported</b>	boolean	JT,DT	<b>MAY</b>	[rfc2911] §4.2.7
<b>pages-per-minute</b>	integer(0:MAX)	PD	<b>MAY</b>	[rfc2911] §4.4.36
<b>pages-per-minute-color</b>	integer(0:MAX)	PD	<b>MAY</b>	[rfc2911] §4.4.37
<b>pages-per-subset-supported</b>	boolean	PD	<b>MAY</b>	[pwg5100.4] §5.3.2
<b>parent-printers-supported</b>	1setOf uri	PD	<b>MAY</b>	[adm-ops] §7.2
<b>pdl-override-supported</b>	type2 keyword	PD	<b>MUST</b>	[rfc2911] §4.4.28 [ippsave] §8.1
<b>presentation-direction-number-up-default</b>	type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.3] §3.17
<b>presentation-direction-number-up-supported</b>	1setOf type2 keyword	JT,DT	<b>MAY</b>	[pwg5100.3] §3.17
<b>printer-current-time</b>	dateTime	PD	<b>MAY</b>	[rfc2911] §4.4.30
<b>printer-detailed-status-messages</b>	1setOf text(MAX)	PD	<b>MAY</b>	[ippsave] §7.7
<b>printer-driver-installer</b>	uri	PD	<b>MAY</b>	[rfc2911] §4.4.8
<b>printer-info</b>	text(127)	PD	<b>MAY</b>	[rfc2911] §4.4.6
<b>printer-is-accepting-jobs</b>	boolean	PD	<b>MUST</b>	[rfc2911] §4.4.23

<sup>57</sup> A Printer MUST support "multiple-document-handling-default", "multiple-document-handling-default", "multiple-document-jobs-supported", and "multiple-operation-time-out" Printer attributes since the Printer MUST support multiple document jobs, even though they are OPTIONAL for a Printer to conform to [rfc2911].

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>printer-location</b>	text(127)	PD	MAY	[rfc2911] §4.4.5
<b>printer-make-and-model</b>	text(127)	PD	MAY	[rfc2911] §4.4.9
<b>printer-message-date-time</b>	dateTime	PD	MAY	[rfc3380] §6.5
<b>printer-message-from-operator</b>	text(127)	PD	MAY	[rfc2911] §4.4.25
<b>printer-message-time</b>	integer(MIN:MAX)	PD	MAY	[rfc3380] §6.4
<b>printer-more-info</b>	uri	PD	MAY	[rfc2911] §4.4.7
<b>printer-more-info-manufacturer</b>	uri	PD	MAY	[rfc2911] §4.4.10
<b>printer-name</b>	name(127)	PD	MUST	[rfc2911] §4.4.4
<b>printer-notify-server-uri</b>	uri	PD	MAY	[not-srv] §4.1
<b>printer-resolution-default</b>	resolution	JT,DT	MAY	[rfc2911] §4.2.12
<b>printer-resolution-supported</b>	1setOf resolution	JT,DT	MAY	[rfc2911] §4.2.12
<b>printer-settable-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.1
<b>printer-state</b>	type1 enum	PD	MUST	[rfc2911] §4.4.11
<b>printer-state-change-date-time</b>	dateTime	PD	MAY	[ntfy] §6.2
<b>printer-state-change-time</b>	integer(1:MAX)	PD	MAY	[ntfy] §6.1
<b>printer-state-message</b>	text(MAX)	PD	MAY	[rfc2911] §4.4.13
<b>printer-state-reasons</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.12
<b>printer-up-time</b>	integer(1:MAX))	PD	MUST	[rfc2911] §4.4.29
<b>printer-uri-supported</b>	1setOf uri	PD	MUST	[rfc2911] §4.4.1
<b>printer-xri-supported</b>	1setOf collection	PD	MAY	[rfc3380] §6.6
<b>xri-uri</b>	uri	PD	MUST	[rfc3380] §6.6
<b>xri-authentication</b>	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
<b>xri-security</b>	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
<b>print-quality-default</b>	type2 enum	JT,DT	MAY	[rfc2911] §4.2.13
<b>print-quality-supported</b>	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.13
<b>queued-job-count</b>	integer(0:MAX)	PD	MUST	[rfc2911] §4.4.24
<b>reference-uri-schemes-supported</b>	1setOf uriScheme	PD	MUST <sup>58</sup>	[rfc2911] §4.4.27
<b>separator-sheets-default</b>	collection	JT,DT	MAY	[pwg5100.3] §3.18.3
<b>separator-sheets-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.18.4
<b>separator-sheets-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.18.1.1
<b>sheet-collate-default</b>	type2 keyword	JT,DT	MAY	[rfc3381] §3.1
<b>sheet-collate-supported</b>	1setOf type2 keyword	JT,DT	MAY	[rfc3381] §3.1
<b>sides-default</b>	type2 keyword	JT,DT	MAY	[rfc2911] §4.2.8
<b>sides-supported</b>	1setOf type2 keyword	JT,DT	MAY	[rfc2911] §4.2.8
<b>stitching-locations-supported</b>	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.3.1
<b>stitching-offset-supported</b>	1setOf (integer (0:MAX)   rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.2.1
<b>stitching-reference-edge-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.2.2.1.1
<b>subordinate-printers-supported</b>	1setOf uri	PD	MAY	[adm-ops] §7.1
<b>uri-authentication-supported</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.2
<b>uri-security-supported</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.3
<b>user-defined-values-supported</b>	1setOf type2 keyword	PD	MAY	[pwg5100.3] §5.1
<b>which-jobs-supported</b>	1setOf type2 keyword	PD	MAY	[ippsave] §7.8
<b>x-image-position-default</b>	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.2

<sup>58</sup> The Printer MUST support "reference-uri-scheme-supported" Printer Description attribute, since the Send-URI operation is REQUIRED.



Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>x-image-position-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.2
<b>x-image-shift-default</b>	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.3
<b>x-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.3
<b>xri-authentication-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.8
<b>xri-security-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.9
<b>xri-uri-scheme-supported</b>	1setOf uriScheme	PD	MAY	[rfc3380] §6.7
<b>x-side1-image-shift-default</b>	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.4
<b>x-side1-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.4
<b>x-side2-image-shift-default</b>	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.5
<b>x-side2-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.5
<b>y-image-position-default</b>	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.6
<b>y-image-position-supported</b>	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.6
<b>y-image-shift-default</b>	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.7
<b>y-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.7
<b>y-side1-image-shift-default</b>	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.8
<b>y-side1-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.8
<b>y-side2-image-shift-default</b>	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.9
<b>y-side2-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.9

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

### 10.1 attributes-charset-supported (1setOf charset)

This REQUIRED Printer Description attribute indicates the charsets that the Printer supports as values of text and name attributes, that is, supports as values of the “attributes-charset” Operation attribute ([rfc2911] section 3.1.4), Job Description ([rfc2911] section 4.3.19), and Document Description attributes (section 9.2.1).

### 10.2 attributes-natural-language-supported (1setOf naturalLanguage)

This REQUIRED Printer Description attribute indicates the natural languages that the Printer supports as values of test and name attributes, that is, supports as values of the “attributes-natural-language” Operation attribute ([rfc2911] section 3.1.4), Job Description ([rfc2911] section 4.3.20), and Document Description attributes (section 9.2.2).

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

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

### 10.4 printer-state-reasons (1setOf type2 keyword)

This Printer Description attribute augments the “printer-state” of the Printer with additional information about the state of the Printer. Table 15 lists all of the values defined for the “printer-state-reasons” Printer Description attribute.



2009

**Table 15 - Values of the "printer-state-reasons" Printer attribute**

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
<b>printer-state-reasons</b>	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 <sup>59</sup>	[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 <sup>60</sup>	[rfc2911] §4.4.12
	shutdown	MAY	[rfc2911] §4.4.12
	spool-area-full	SHOULD	[rfc2911] §4.4.12
	stopped-partly	MAY	[rfc2911] §4.4.12
	stopping	MAY	[rfc2911] §4.4.12
	timed-out	MAY	[rfc2911] §4.4.12
	toner-empty	MAY	[rfc2911] §4.4.12
	toner-low	MAY	[rfc2911] §4.4.12

2010

2011 This description is taken from [rfc2911] with additions from other IPP extension documents:

2012 This REQUIRED Printer attribute supplies additional detail about the device's state. Some of these value  
 2013 definitions indicate conformance requirements; the rest are OPTIONAL.

<sup>59</sup> The Printer MUST support the 'moving-to-paused' value if the Printer supports the Pause-Printer operation and the Printer takes significant time to move to paused.

<sup>60</sup> The Printer MUST support the 'paused' value if the Printer supports the Pause-Printer operation.

- 2014 Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe),  
2015 warning, and error (most severe).
- 2016 **'-report'**: This suffix indicates that the reason is a "report". An implementation may choose to omit some or  
2017 all reports. Some reports specify finer granularity about the printer state; others serve as a precursor  
2018 to a warning. A report MUST contain nothing that could affect the printed output.
- 2019 **'-warning'**: This suffix indicates that the reason is a "warning". An implementation may choose to omit some  
2020 or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that  
2021 prevents a job from completing, though in some cases the output may be of lower quality.
- 2022 **'-error'**: This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this  
2023 attribute contains one or more errors, printer MUST be in the stopped state.
- 2024 If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an  
2025 "error".
- 2026 If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the  
2027 output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a  
2028 warning in the Printer's "printer-state-reasons" attribute. If the "printer-state" for such a Printer has a value of  
2029 'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.
- 2030 The following standard keyword values are defined (in alphabetical order):
- 2031 **'other'**: The device has detected an error other than one listed in this document.
- 2032 **'none'**: There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without  
2033 any value and MUST be used, since the 1setOf attribute syntax requires at least one value.
- 2034 **'connecting-to-device'**: The Printer object has scheduled a job on the output device and is in the process of  
2035 connecting to a shared network output device (and might not be able to actually start printing the job  
2036 for an arbitrarily long time depending on the usage of the output device by other servers on the  
2037 network).
- 2038 **'cover-open'**: One or more covers on the device are open.
- 2039 **'deactivated'**: A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]  
2040 section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.  
2041 The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-  
2042 Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URI (so that partial job submission can  
2043 be completed - see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status  
2044 code.
- 2045 **'developer-empty'**: The device is out of developer.
- 2046 **'developer-low'**: The device is low on developer.
- 2047 **'door-open'**: One or more doors on the device are open.
- 2048 **'fuser-over-temp'**: The fuser temperature is above normal.
- 2049 **'fuser-under-temp'**: The fuser temperature is below normal.
- 2050 **'hold-new-jobs'**: The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or  
2051 other means, but the output-device(s) are taking an appreciable time to stop. Later, when all output  
2052 has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-  
2053 paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-  
2054 New-Jobs operation is supported and the implementation takes significant time to pause a device in  
2055 certain circumstances.
- 2056 **'input-tray-missing'**: One or more input trays are not in the device.

- 2057 **'interlock-open'**: One or more interlock devices on the printer are unlocked.
- 2058 **'interpreter-resource-unavailable'**: An interpreter resource is unavailable (i.e. font, form)
- 2059 **'marker-supply-empty'**: The device is out of at least one marker supply. (e.g. toner, ink, ribbon)
- 2060 **'marker-supply-low'**: The device is low on at least one marker supply. (e.g. toner, ink, ribbon)
- 2061 **'marker-waste-almost-full'**: The device marker supply waste receptacle is almost full.
- 2062 **'marker-waste-full'**: The device marker supply waste receptacle is full.
- 2063 **'media-empty'**: At least one input tray is empty.
- 2064 **'media-jam'**: The device has a media jam.
- 2065 **'media-low'**: At least one input tray is low on media.
- 2066 **'media-needed'**: A tray has run out of media.
- 2067 **'moving-to-paused'**: Someone has paused the Printer object using the Pause-Printer operation (see  
2068 [rfc2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.  
2069 Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value  
2070 replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be  
2071 supported, if the Pause-Printer operation is supported and the implementation takes significant time  
2072 to pause a device in certain circumstances.
- 2073 **'opc-life-over'**: The optical photo conductor is no longer functioning.
- 2074 **'opc-near-eol'**: The optical photo conductor is near end of life.
- 2075 **'output-area-almost-full'**: One or more output area is almost full (e.g. tray, stacker, collator).
- 2076 **'output-area-full'**: One or more output area is full. (e.g. tray, stacker, collator)
- 2077 **'output-tray-missing'**: One or more output trays are not in the device
- 2078 **'paused'**: Someone has paused the Printer object using the Pause-Printer operation (see [rfc2911] section  
2079 3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer  
2080 MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a  
2081 Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that  
2082 job when the Printer is no longer paused and leave no evidence in the printed output of such a  
2083 pause. This value MUST be supported, if the Pause-Printer operation is supported.
- 2084 **'shutdown'**: Someone has removed a Printer object from service, and the device may be powered down or  
2085 physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the  
2086 Printer object is realized by a print server that is still active, the Printer object MUST perform no other  
2087 operations requested by a client, including returning this value. If a Printer object had been printing a  
2088 job when it was shutdown, the Printer MAY resume printing that job when the Printer is no longer  
2089 shutdown. If the Printer resumes printing such a job, it MAY leave evidence in the printed output of  
2090 such a shutdown, e.g. the part printed before the shutdown MAY be printed a second time after the  
2091 shutdown.
- 2092 **'spool-area-full'**: The limit of persistent storage allocated for spooling has been reached. The Printer is  
2093 temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept  
2094 more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small  
2095 number jobs at a time or a spooling Printer that has filled the spool space.
- 2096 **'stopped-partly'**: When a Printer object controls more than one output device, this reason indicates that one  
2097 or more output devices are stopped. If the reason is a report, fewer than half of the output devices  
2098 are stopped. If the reason is a warning, fewer than all of the output devices are stopped.
- 2099 **'stopping'**: The Printer object is in the process of stopping the device and will be stopped in a while. When  
2100 the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The  
2101 'stopping-warning' reason is never an error, even for a Printer with a single output device. When an

- 2102                    output-device ceases accepting jobs, the Printer will have this reason while the output device
- 2103                    completes printing.
- 2104                    **'timed-out'**: The server was able to connect to the output device (or is always connected), but was unable to
- 2105                    get a response from the output device.
- 2106                    **'toner-empty'**: The device is out of toner.
- 2107                    **'toner-low'**: The device is low on toner.

2108                    **11 New Values for Existing Printer Description Attributes**

2109                    This section contains those attributes for which additional values are added.

2110                    **11.1 operations-supported (1setOf type2 enum)**

2111                    The following “operation-id” values are added in order to support the new operations defined in this document:

2112                    **Table 16 – Operation-id assignments**

Value	Operation Name	Reference
0x000F	Close-Job	[this-spec] § <b>Error!</b> <b>Reference source not found.</b>
0x0033	Cancel-Documents	[this-spec] §4.7
0x0034	Get-Documents-Attributes	[this-spec] §4.5
0x0035	Get-Documents	[this-spec] §3.3
0x0036	Delete-Documents	[this-spec] §5.4
0x0037	Set-Documents-Attributes	[this-spec] §4.6
0x0039	Create-Documents	[this-spec] §4.1
0x003A	Send-Data	[this-spec] §4.2

2113

2114                    **12 Encodings of Additional Attribute Tags**

2115                    This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910]).

2116                    The “document-attributes-tag” delimits Document Template Attributes Groups in requests and Document Attributes

2117                    Groups in responses.

2118                    The following table specifies the values for the delimiter tag:

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

2119

2120                    **13 Conformance Requirements**

2121                    This section specifies the conformance requirements for Printers and clients.

## 2122 13.1 Printer conformance requirements

2123 In order to conform to this specification, a Printer:

- 2124 1. MUST meet the conformance requirements for Printers specified in [rfc2911].
- 2125 2. MUST support the Job operation that section 3 REQUIRES a Printer to support.
- 2126 3. MUST support the Document operations that section 4 REQUIRES a Printer to support.
- 2127 4. MAY support any of the Administrative operations in section 5.
- 2128 5. MUST support the Attribute Precedence semantics specified in section 6 for the levels that the Printer  
2129 supports.
- 2130 6. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI  
2131 operation that section 7 REQUIRES a Printer to support.
- 2132 7. MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the  
2133 corresponding Document Description attributes that section 9 REQUIRES a Printer to support and any  
2134 "xxx-default" and "xxx-supported" Printer attributes that section 10 REQUIRES a Printer to support.
- 2135 8. MAY support any of the Document Template attributes in Document Creation operations as indicated in  
2136 section 8 and MUST NOT support them for contexts for where they are not defined as indicated in the  
2137 Table 11 with an "-".
- 2138 9. MUST support the Document Description attributes that section 9 REQUIRES a Printer to support.
- 2139 10. MUST support the Printer attributes that section 10 REQUIRES a Printer to support.
- 2140 11. MUST support the values of Printer Description attributes that section 11 REQUIRES a Printer to  
2141 support.

## 2142 13.2 Client conformance requirements

2143 In order to conform to this specification, a client:

- 2144 1. MUST meet the conformance requirements for clients specified in [rfc2911]
- 2145 2. MAY support any of the Document operations defined in section 3.7.
- 2146 3. MUST supply the Operation attributes that section 7 REQUIRES a client to supply in operation requests.
- 2147 4. MUST supply any Document Template attributes in the format that section 8 REQUIRES a client to supply in  
2148 Document Creation operations and MUST NOT support them for contexts for where they are not defined as  
2149 indicated in the Table 11 with an "n".
- 2150 5. SHOULD support any of the Document Description attributes that section 9 REQUIRES a Printer to support.
- 2151 6. MAY support any of the Printer attributes listed in section 10.
- 2152 7. MAY support any of the values of the Printer Descriptions attributes in section 11.

## 2153 14 Normative References

2154 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols  
2155 below, rather than the RFC number (except for [rfc2910] and [rfc2911]). IETF RFCs and IANA registrations require  
2156 using the RFC numbers in the body of the document for references.

2157 [adm-ops]  
2158 Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol (IPP): Job and Printer Administrative  
2159 Operations", <draft-ietf-ipp-ops-set2-03.txt>, July 17, 2001.

2160 [dss]  
2161 U.S. Department of Commerce, "Digital Signature Standard (DDS)", Federal Information Processing  
2162 Standards Publication 186-1 (FIPS PUB 186-1), December 15, 1998.

2163 [ippsave]  
2164 Hastings, T., and D. Fullman, "Internet Printing Protocol (IPP): Production Printing Attributes - Set 2", to  
2165 become a PWG IEEE-ISTO standard, work in progress, August 21, 2002,  
2166 [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_PPE/pwg-ipp-pwg5100.3-set2-draft-v0\\_1-020821.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_PPE/pwg-ipp-pwg5100.3-set2-draft-v0_1-020821.pdf).

2167 [ippact]  
2168 Carney, D., and H. Lewis, "Internet Printing Protocol (IPP), "-actual" attributes extension", work in progress,  
2169 January 31, 2003, [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_ACT/pwg-ipp-actual-attrs-v04-030131.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_ACT/pwg-ipp-actual-attrs-v04-030131.pdf)

2170 [get-method]  
2171 Herriot, R., and T. Hastings, "Internet Printing Protocol (IPP): The 'ippget' Delivery Method for Event  
2172 Notifications", <draft-ietf-ipp-notify-get-08.txt>, September 5, 2002.

2173 [iso12639]  
2174 ISO 12639:1998 Graphic technology -- Prepress digital data exchange -- Tag image file format for image  
2175 technology (TIFF/IT), 1998.

2176 [iso15930]  
2177 ISO 15930-1:2001 Graphic technology -- Prepress digital data exchange -- Use of PDF -- Part 1: Complete  
2178 exchange using CMYK data (PDF/X-1 and PDF/X-1a), 2001.

2179 [not-srv]  
2180 Hastings, T., Lewis, H., and Ira McDonald, "Distributed Notification Server", September 26, 2002, work in  
2181 progress to become IEEE-ISTO 5100.6-2002, [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_NOT/ipp-dist-not-service-](ftp://ftp.pwg.org/pub/pwg/ipp/new_NOT/ipp-dist-not-service-020926.doc)  
2182 [020926.doc](ftp://ftp.pwg.org/pub/pwg/ipp/new_NOT/ipp-dist-not-service-020926.doc)

2183 [ntfy]  
2184 Herriot, R., Hastings, T., Shepherd, M., deBry, R., Isaacson, S., Martin, J., and R. Bergman, "Internet Printing  
2185 Protocol/1.1: Event Notifications and Subscriptions", <draft-ietf-ipp-not-spec-08.txt>, November 19, 2001.

2186 [pdf]  
2187 "Adobe Portable Document Format", Version 1.4, PDF Reference, Third Edition, Adobe Systems  
2188 Incorporated, <http://www.adobe.com>, December 2001.



- 2189 [pwg5100.1]  
2190 Hastings, T., Fullman, D., "Internet Printing Protocol (IPP): "finishings" attribute values extension", IEEE-ISTO  
2191 5100.1-2001, February 5, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.1.pdf>
- 2192 [pwg5100.2]  
2193 Hastings, T., and R. Bergman, "Internet Printing Protocol (IPP): output-bin attribute extension", IEEE-ISTO  
2194 5100.2-2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf>.
- 2195 [pwg5100.4]  
2196 Herriot, R., Ocke, K., "Internet Printing Protocol (IPP): Override Attributes for Documents and Pages", IEEE-  
2197 ISTO 5100.4-2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf>.
- 2198 [pwg5100.3]  
2199 Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO  
2200 5100.3-2001, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>.
- 2201 [pwg5101.1]  
2202 IEEE-ISTO PWG 5101.1-2002, "The Printer Working Group Standard for Media Standardized Names", 26  
2203 February 2002, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5101.1.pdf>, .doc, .rtf
- 2204 [rfc1991]  
2205 D. Atkins, W. Stallings, P. Zimmermann, "PGP Message Exchange Formats", RFC 1991, August, 1996.
- 2206 [rfc2634]  
2207 P. Hoffman, "Enhanced Security Services for S/MIME", RFC 2634, June 1999.
- 2208 [rfc2854]  
2209 Connolly, D., and L. Masinter, "The 'text/html' Media Type", RFC 2854, June 2000.
- 2210 [rfc2911]  
2211 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.1: Model and  
2212 Semantics", RFC 2911, September 2000.
- 2213 [rfc3380]  
2214 Hastings, T., Herriot, R., Kugler, C., and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set  
2215 Operations", RFC 3380, September 2002.
- 2216 [rfc3381]  
2217 Hastings, T., Lewis, H., and R. Bergman, "Internet Printing Protocol (IPP): Job Progress Attributes",  
2218 RFC3381, September 2002.
- 2219 [rfc3382]  
2220 deBry, R., Hastings, T., Herriot, R., Ocke, K., and P. Zehler, "Internet Printing Protocol (IPP): The 'collection'  
2221 attribute syntax", RFC 3382, September 2002.
- 2222 [upnp]  
2223 Microsoft, "Basic *PrintBasic:1.0* Service Template Version 1.01 For Universal Plug and Play Version 1.0"

2224 [xmldsig]  
2225 D. Eastlake, J. Reagle, D. Solo "XML-Signature Syntax and Processing", <draft-ietf-xmldsig-core-11.txt>,  
2226 October 31, 2000.

## 2227 15 Informative References

2228 [color]  
2229 Hastings, T., and D. Fullman, "Color and Imaging Attributes", work in progress, December 5, 2002,  
2230 [ftp://ftp.pwg.org/pub/pwg/new\\_COLOR/pwg-ipp-color-and-imaging-021205.pdf](ftp://ftp.pwg.org/pub/pwg/new_COLOR/pwg-ipp-color-and-imaging-021205.pdf)

2231 [fsg-jt]  
2232 Free Software Group, Open Printing Job Ticket API, Visit: <http://www.freestandards.org/openprinting/>

2233 [pwg-psi]  
2234 "Print Service Interface (PSI)", work in progress to become a PWG IEEE-ISTO standard. Visit  
2235 <http://www.pwg.org/>.

2236 [pwg-sm]  
2237 Zehler, P., and S. Albright, "PWG Semantic Model", work in progress to become a PWG IEEE-ISTO standard,  
2238 version 0.11, September 27, 2002. <ftp://ftp.pwg.org/pub/pwg/Semantic-Model/PWG-Semantic-Model.pdf>

2239 [rfc2046]  
2240 Freed, N., and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC  
2241 2046, November 1996.

2242 [rfc2565]  
2243 Herriot, R., Butler, S., Moore, P., and R. Turner, "Internet Printing Protocol/1.0: Encoding and Transport",  
2244 RFC 2565, April 1999.

2245 [rfc2566]  
2246 R. deBry, T. Hastings, R. Herriot, S. Isaacson, and P. Powell, "Internet Printing Protocol/1.0: Model and  
2247 Semantics", RFC 2566, April 1999.

2248 [rfc2567]  
2249 Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.

2250 [rfc2568]  
2251 Zilles, S., "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol", RFC 2568,  
2252 April 1999.

2253 [rfc2569]  
2254 Herriot, R., Hastings, T., Jacobs, N., Martin, J., "Mapping between LPD and IPP Protocols", RFC 2569, April  
2255 1999.

2256 [rfc2616]  
2257 R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, "Hypertext Transfer  
2258 Protocol - HTTP/1.1", RFC 2616, June 1999.

2259

[rfc3196]

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

2262

[rfc3239]

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

## 16 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 to [this spec] with the RFC number for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

### 16.1 Attribute Registrations

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

Attribute Name (attribute syntax)	Reference	Section
-----	-----	-----
Document Description attributes:		
attributes-charset (charset)	[this spec]	9.2.1
attributes-natural-language (naturalLanguage)	[this spec]	9.2.2
compression (type3 keyword)	[this spec]	9.2.3
current-page-order (type2 keyword)	[this spec]	9.2.4
date-time-at-completed (dateTime)	[this spec]	9.2.5
date-time-at-creation (dateTime)	[this spec]	9.2.6
date-time-at-processing (dateTime)	[this spec]	9.2.7
detailed-status-message (1setOf text (MAX))	[this spec]	9.2.21
document-access-errors (1setOf text (MAX))	[this spec]	9.2.22
document-format (mimeMediaType)	[this spec]	9.2.8
document-job-id (integer(1:MAX))	[this spec]	9.2.9
document-job-uri (uri)	[this spec]	9.2.10
document-message (text (MAX))	[this spec]	9.2.11
document-name (name (MAX))	[this spec]	9.2.12
document-natural-language (naturalLanguage)	[this spec]	9.2.13
document-number (integer(0:MAX))	[this spec]	9.2.14

2301	document-printer-uri (uri)	[this spec]	9.2.15
2302	document-state (type1 enum)	[this spec]	9.2.16
2303	document-state-message (text(MAX))	[this spec]	9.2.17
2304	document-state-reasons (1setOf type2 keyword)	[this spec]	9.2.18
2305	document-uri (uri)	[this spec]	9.2.19
2306	impressions (integer(0:MAX))	[this spec]	9.2.23
2307	impressions-completed (integer(0:MAX))	[this spec]	9.2.24
2308	impressions-completed-current-copy (integer(0:MAX))		
2309		[this spec]	9.2.20
2310	k-octets (integer(0:MAX))	[this spec]	9.2.25
2311	k-octets-processed (integer(0:MAX))	[this spec]	9.2.26
2312	last-document (boolean)	[this spec]	9.2.31
2313	media-sheets (integer(0:MAX))	[this spec]	9.2.27
2314	media-sheets-completed (integer(0:MAX))	[this spec]	9.2.28
2315	more-info (uri)	[this spec]	9.2.29
2316	output-device-assigned (name(127))	[this spec]	9.2.32
2317	printer-up-time (integer (1:MAX))	[this spec]	9.2.30
2318	sheet-completed-copy-number (integer(0:MAX))	[this spec]	9.2.33
2319	time-at-completed (integer (MIN:MAX))	[this spec]	9.2.34
2320	time-at-creation (integer (MIN:MAX))	[this spec]	9.2.35
2321	time-at-processing (integer (MIN:MAX))	[this spec]	9.2.36

2322

2323

2324 Document Templates attributes:

2325 ACTION (Tom) - Need to add the xxx-default and xxx-supported for each.

2326	copies (integer(1:MAX))	[this spec]	8
2327	cover-back (collection)	[this spec]	8
2328	cover-type (type2 keyword)	[this spec]	8
2329	media (type3 keyword   name(MAX))	[this spec]	8
2330	media-col (collection)	[this spec]	8
2331	cover-front (collection)	[this spec]	8
2332	cover-type (type2 keyword)	[this spec]	8
2333	media (type3 keyword   name(MAX))	[this spec]	8
2334	media-col (collection)	[this spec]	8
2335	feed-orientation (type3 keyword)	[this spec]	8
2336	finishings (1setOf type2 enum)	[this spec]	8
2337	finishings-col (collection)	[this spec]	8
2338	finishing-template (name(MAX))	[this spec]	8
2339	stitching (collection)	[this spec]	8
2340	stitching-locations (1setOf integer(0:MAX))	[this spec]	8
2341	stitching-offset (integer (0:MAX))	[this spec]	8
2342	stitching-reference-edge (type2 keyword)	[this spec]	8
2343	font-name-requested (name(MAX))	[this spec]	8
2344	font-size-requested (integer(1:MAX))	[this spec]	8
2345	force-front-side (1setOf integer(1:MAX))	[this spec]	8
2346	imposition-template (type2 keyword   name(MAX))	[this spec]	8

2347	insert-sheet (1setOf collection)	[this spec]	8
2348	insert-after-page-number (integer(0:MAX))	[this spec]	8
2349	insert-count (integer(0:MAX))	[this spec]	8
2350	media (type3 keyword   name(MAX))	[this spec]	8
2351	media-col (collection)	[this spec]	8
2352	media (type3 keyword   name(MAX))	[this spec]	8
2353	media-col (collection)	[this spec]	8
2354	media-back-coating (type3 keyword   name(MAX))	[this spec]	8
2355	media-color (type3 keyword   name(MAX))	[this spec]	8
2356	media-front-coating (type3 keyword   name(MAX))	[this spec]	8
2357	media-hole-count (integer(0:MAX))	[this spec]	8
2358	media-info (text(255))	[this spec]	8
2359	media-key (type3 keyword   name(MAX))	[this spec]	8
2360	media-order-count (integer(1:MAX))	[this spec]	8
2361	media-preprinted (type3 keyword   name(MAX))	[this spec]	8
2362	media-recycled (type3 keyword   name(MAX))	[this spec]	8
2363	media-size (collection)	[this spec]	8
2364	x-dimension (integer(0:MAX))	[this spec]	8
2365	y-dimension (integer(0:MAX))	[this spec]	8
2366	media-type (type3 keyword   name(MAX))	[this spec]	8
2367	media-weight-metric (integer(0:MAX))	[this spec]	8
2368	media-input-tray-check (type3 keyword   name(MAX))		
2369		[this spec]	8
2370	number-up (integer(1:MAX))	[this spec]	8
2371	orientation-requested (type2 enum)	[this spec]	8
2372	output-bin (type2 keyword   name(MAX))	[this spec]	8
2373	page-delivery (type2 keyword)	[this spec]	8
2374	page-order-received (type2 keyword)	[this spec]	8
2375	page-overrides (1setOf collection)	[this spec]	8
2376	document-copies (1setOf rangeOfInteger(MAX))	[this spec]	8
2377	input-documents (1setOf rangeOfInteger(MAX))	[this spec]	8
2378	output-documents (1setOf rangeOfInteger(MAX))	[this spec]	8
2379	pages (1setOf rangeOfInteger(MAX))	[this spec]	8
2380	<any other Job Template attributes that affect pages,		
2381	such as media or media-col>		
2382	page-ranges (1setOf rangeOfInteger(1:MAX))	[this spec]	8
2383	pages-per-subset (1setOf integer(1:MAX))	[this spec]	8
2384	presentation-direction-number-up (type2 keyword)	[this spec]	8
2385	print-quality (type2 enum)	[this spec]	8
2386	printer-resolution (resolution)	[this spec]	8
2387	separator-sheets (collection)	[this spec]	8
2388	media (type3 keyword   name(MAX))	[this spec]	8
2389	media-col (collection)	[this spec]	8
2390	separator-sheets-type (type3 keyword   name(MAX))		
2391		[this spec]	8
2392	sheet-collate (type2 keyword)	[this spec]	8

2393	sides (type2 keyword)	[this spec]	8
2394	x-image-position (type2 keyword)	[this spec]	8
2395	x-image-shift (integer(MIN:MAX))	[this spec]	8
2396	x-side1-image-shift (integer(MIN:MAX))	[this spec]	8
2397	x-side2-image-shift (integer(MIN:MAX))	[this spec]	8
2398	y-image-position (type2 keyword)	[this spec]	8
2399	y-image-shift (integer(MIN:MAX))	[this spec]	8
2400	y-side1-image-shift (integer(MIN:MAX))	[this spec]	8
2401	y-side2-image-shift (integer(MIN:MAX))	[this spec]	8
2402			
2403			
2404	Job Description attributes:		
2405	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	<b>Error!</b>
2406	<b>Reference source not found.</b>		
2407			
2408			
2409	Job Template attributes:		
2410	<b>ACTION (Tom) - Need to add the JT and DT xxx-default and xxx-supported.</b>		
2411	job-copies (integer(1:MAX))	[this spec]	<b>Error!</b>
2412	<b>Reference source not found.</b>		
2413	job-cover-back (collection)	[this spec]	<b>Error!</b>
2414	<b>Reference source not found.</b>		
2415	<member attributes are the same as "cover-back">		
2416	job-cover-front (collection)	[this spec]	<b>Error!</b>
2417	<b>Reference source not found.</b>		
2418	<member attributes are the same as "cover-front">		
2419	job-finishings (1setOf type2 enum)	[this spec]	<b>Error!</b>
2420	<b>Reference source not found.</b>		
2421	job-finishings-col (1setOf collection)	[this spec]	<b>Error!</b>
2422	<b>Reference source not found.</b>		
2423	<member attributes are the same as "finishings-col">		
2424	media-size-name (type3 keyword   name(MAX))	[this spec]	<b>Error!</b>
2425	<b>Reference source not found.</b>		
2426	media-type (type3 keyword   name(MAX))	[this spec]	<b>Error!</b>
2427	<b>Reference source not found.</b>		
2428			
2429			
2430	Printer Description attributes:		
2431	document-creation-attributes-supported (1setOf type2 keyword)		
2432		[this spec]	10.3
2433			
2434	Operation attributes:		
2435	document-message (text(MAX))	[this spec]	4.1.1.2
2436	last-document (boolean)	[this spec]	4.1.1.1



2437 **16.2 Keyword attribute values**

2438 ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values registered for  
2439 corresponding attributes.

2440 **16.3 Enum Attribute Values**

2441 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.  
2442 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

Value	Name	Reference	Section:
-----	-----	-----	-----
document-state	(type1 enum)	[this spec]	9.2.16
3	pending	[this spec]	9.2.16
5	processing	[this spec]	9.2.16
7	canceled	[this spec]	9.2.16
8	aborted	[this spec]	9.2.16
9	completed	[this spec]	9.2.16
job-finishings	(1setOf type2 enum)	[this spec]	<b>Error!</b>
<b>Reference source not found.</b>			
<enum values are the same as "finishings">			
operations-supported	(type2 enum)	[rfc2911]	4.4.15
0x0033	Cancel-Document	[this spec]	4.7
0x0034	Get-Document-Attributes	[this spec]	4.5
0x0035	Get-Documents	[this spec]	3.3
0x0036	Delete-Document	[this spec]	5.4
0x0037	Set-Document-Attributes	[this spec]	4.6
0x0039	Create-Document	[this spec]	4.1
0x003A	Send-Data	[this spec]	4.2

2466 **16.4 Operations**

2467 The following table lists all of the operations defined in this document. These are to be registered according to the  
2468 procedures in RFC 2911 [rfc2911] section 6.4.

Operations	Reference	Section
-----	-----	-----
Cancel-Document	[this spec]	4.7
Create-Document	[this spec]	4.1
Delete-Document	[this spec]	5.4
Get-Document-Attributes	[this spec]	4.5
Get-Documents	[this spec]	3.3
Send-Data	[this spec]	4.2
Set-Document-Attributes	[this spec]	4.6

2480 **16.5 Attribute Group tags**

2481 The following table lists all the attribute group tags defined in this document. These are to be registered according to  
2482 the procedures in RFC 2911 [rfc2911] section 6.5.

2483	Value	Name	Reference	Section
2484	-----	-----	-----	-----
2485	0x09	document-attributes-tag	[this spec]	12
2486				

2487 **17 Internationalization Considerations**

2488 The internationalization considerations for this extension for handling the Document object are the same as for  
2489 handling the Job object in [rfc2911].

2490 **18 Security Considerations**

2491 The Document object should provide no more increased security considerations than the Job object. The Printer  
2492 MUST provide the same access control for Document objects as for Job objects.

2493 As with the Create-Job operation is [rfc2911], the Printer implementer needs to consider counter measures for denial  
2494 of service attacks for the Create-Documents operation. For example, a rogue client could issue repeated Create-  
2495 Document requests in an attempt to exceed the capacity of the Printer to absorb such requests and thereby deny Job  
2496 Creation and Document Creation requests from other clients. For example, avoid a fixed set of allocations for Jobs  
2497 and Documents. Also be able to detect when an excessive number of Create-Job and Create-Documents requests  
2498 have been supplied. In such a case, the Printer would return either a 'server-error-service-unavailable' status code  
2499 (see [rfc2911] section 13.1.5.3) or a 'server-error-temporary-error' status code (see [rfc2911] 13.1.5.6).

2500 **19 Contributors**

2501 Dennis Carney, IBM  
2502 Don Fullman, Xerox  
2503 Harry Lewis, IBM  
2504 Ira McDonald, High North  
2505 Michael Sweet, Easy Software Products  
2506

2507 **20 Acknowledgments**

2508 **21 Author's Address**

2509 Tom Hastings  
2510 Xerox Corporation  
2511 737 Hawaii St.  
2512 El Segundo, CA 90245  
2513

2514 Phone: 310 333-6413  
 2515 Fax: 310 333-5514  
 2516 e-mail: hastings@cp10.es.xerox.com

2517  
 2518 Peter Zehler  
 2519 Xerox Corporation  
 2520 MS: 0128-30E  
 2521 800 Phillips Road  
 2522 Webster, NY 14580-9701

2523  
 2524 Phone: 585 265-8755  
 2525 Fax: 585 422-7961  
 2526 e-mail: PZehler@crt.xerox.com

## 2527 22 Appendix A: Document operations compared to Job operations

2528 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2529 Table 17 compares the Job and Document operations. The two Conf. columns indicate the conformance  
 2530 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"  
 2531 in the Document Conformance column means if the Document object is supported. Whether a Document operation  
 2532 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part  
 2533 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-  
 2534 based protocols, APIs, and implementations.

2535 **Table 17 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
<b>Cancel-Current-Job</b>	OPT	<i>N/A, can only cancel a document explicitly by document number and explicit job id.</i>	OPT
<b>Cancel-Job</b>	REQ	<b>Cancel-Document</b>	REQ
<b>Create-Job</b>	OPT	<b>Create-Document</b>	OPT
<b>Get-Job-Attributes</b>	REQ	<b>Get-Document-Attributes</b>	REQ
<b>Get-Jobs</b>	REQ	<b>Get-Documents</b>	REQ
<b>Hold-Job</b>		<i>N/A, can only hold an entire job.</i>	
<b>Print-Job</b>	REQ	<b>Send-Document</b> (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.3)	OPT
<b>Print-URI</b>	OPT	<b>Send-URI</b> (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.4)	OPT
<i>N/A</i>		<b>Send-Data</b>	REQ
<b>Promote-Job</b>	OPT	<i>N/A, can only promote an entire job</i>	
<b>Purge-Jobs</b>	OPT	<b>Delete-Document</b>	OPT
<b>Release-Held-New-Jobs</b>	OPT	<i>N/A, can only release entire jobs</i>	
<b>Release-Job</b>	OPT	<i>N/A, can only release an entire job</i>	
<b>Reprocess-Job</b>	OPT	<i>N/A, can only reprocess an entire job</i>	
<b>Restart-Job</b>	OPT	<i>N/A, can only restart an entire job</i>	
<b>Resume-Job</b>	OPT	<i>N/A, can only resume an entire job</i>	
<b>Schedule-Job-After</b>	OPT	<i>N/A, can only schedule an entire job</i>	
<b>Set-Job-Attributes</b>	OPT	<b>Set-Document-Attributes</b>	OPT
<b>Suspend-Current-Job</b>	OPT	<i>N/A, can only suspend an entire job in order to run another one</i>	
<b>Validate-Job</b>	REQ	<i>N/A, use Validate-Job to validate a single document or use Create-Job</i>	REQ

Job operations	Job Conf.	Document operations	Doc Conf
		<i>with "ipp-attribute-fidelity" = 'true' and Create-Document request to validate a multi-document job.</i>	

2536  
2537

## 2538 23 Annex B: Change Log (informative)

2539 The following summaries of the changes in chronological order:

2540 Version 0.3, 9 September 2002:

- 2541 1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
- 2542 2. Added "original-requesting-user-name" Operation attribute to Table 8.
- 2543 3. Added "y" to "output-bin" in Table 10 so it MAY be a Document Template attribute.
- 2544 4. Clarified the \* and in Table 11 - Job and Document Description attributes.
- 2545 5. Added section 9.2.1 all of the Printer attributes defined In any IPP standard.
- 2546 6. Allocated operation-id enums in section 11 to the 7 Document operations.
- 2547 7. Added the conformance section 13
- 2548 8. Completed the IANA Considerations section 16.

2549

2550 Version 0.4, 14 October 2002:

- 2551 1. Added the operation specifications.
- 2552 2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
- 2553 3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
- 2554 4. Added the Attribute Precedence section 6.
- 2555 5. Added [ippsave] attributes.
- 2556 6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
- 2557 document-id-uri, and redirect-uri.

2558

2559 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:

- 2560 1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
- 2561 the PWG Last Call to progress as a Draft Standard.
- 2562 2. Changed Cancel-Document from OPTIONAL to REQUIRED.
- 2563 3. Added Table 4 and Table 5 to show the request and response signatures of the Document Creation and
- 2564 Validation operations.
- 2565 4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4]
- 2566 and because the Document object is really the Input Document (as opposed to the Output Document). The
- 2567 Printer copies this value to the Document's "document-number" Document Description attribute.
- 2568 5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
- 2569 6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
- 2570 7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the
- 2571 "document-message" agreement (see point #15 ).
- 2572 8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in
- 2573 Group 4.
- 2574 9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
- 2575 attribute in a Document Creation response.
- 2576 10. Added the "document-mandatory-attributes" Operation attribute.
- 2577 11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
- 2578 Attributes and the other Document attributes.
- 2579 12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
- 2580 13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.

14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number" and "document-id-uri" to be parallel with the Get-Jobs operation.
15. Changed the "message" Operation attribute in Cancel-Documents and Cancel-Current-Documents to "document-message" Operation attribute which the Printer copies to the "document-message" Document Description attribute for use both by the user and the operator.
16. Clarified that the "document-state-reasons" values never affect Job scheduling.
17. Made Job Level - page override programming higher precedence than Document level Document object attributes.
18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-requested".
19. In Table 8, flagged the Operation attributes that the Printer copies to the corresponding Job and Document Description attributes in Document Creations operations.
20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have "document-mandatory-attributes" Operation attribute.
21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages across Input-Documents.
23. Disallowed "page-ranges" at the Page Level.
24. Disallowed "pages-per-subset" at the Document level (and Page Level).
25. Disallowed "separator-sheets" at the Page Level.
26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-Jobs and Get-Job-Attributes.

Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:

1. Deleted the Cancel-Current-Documents and Validate-Documents operations.
2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.
3. Deleted the "document-mandatory-attributes" Operation attribute to align with the PWG Semantic model. So both specifications have only the "job-mandatory-attributes" Operation attribute. The client can only supply at the Job Level. The Document Level inherits from the Job Level.
4. Increased "document-message" Operation attribute length from 127 to MAX (1023) octets.
5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the Document level inherits their values.
6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute as used by UPnPv1 and UPnPv2.
8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template attributes).
9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
12. Added the following Document Description attributes: "document-format-detail", "document-format-detected", "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
13. Defined all of the Document Description attributes, often with references to other specifications, so that they appear in the table of contents.

Version 0.7, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:

1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
2. Updated the Abstract and Introduction to reflect the additions.
3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
4. Deprecated the "input-document-number" Operation attribute ([pwg5100.4] section 9.2.1 in the Create-Documents Requests
5. Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.

6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using "last-document" still works too and the Printer MUST support both ways.
7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation operation to the Document object as observable in Document object query responses. Document objects inherit that effect from the Job object.
8. Added the following operation and Document Description attributes: document-container-summary (collection), document-creator-application-name (name(MAX)), document-creator-application-version (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-format-device-id (text(127)), document-format-version (text(127)). The "document-container-summary" collection attribute may contain them, plus "document-format" and "document-natural-language".
9. REQUIRED Printers to support "document-format-version" Document Description.
10. Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4] without "document-overrides".
11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with "document-" so that no Document attribute has a "job-" prefix: "job-printer-uri" becomes "document-job-printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
12. Added the encoding for the "document-attributes-tag" as 0x09.
13. Updated the IANA Registration section, but still needs more work.

Version 0.8, 24 March 2003, agreements from the March 20 telecon:

1. Changed the name of the Send-Document-Data back to Send-Data to keep the name short. There wasn't support for keeping the name of the object affected in the name of the operation.
2. Changed "job-mandatory-attributes" operation/Job Description attribute so that a Printer MUST support it.
3. Changed the name of the collection attribute back to "document-format-details".
4. Removed the Operation attributes and Document Description attributes that were already in the member attributes of "document-format-details", so that any details must use the "document-format-details" (1setOf collection).
5. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using "pages-per-subset" and "page-overrides".
6. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward compatibility.
7. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if present.
8. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first collection value.
9. Added "document-format-details-detected (1setOf collection) Document Description attribute.
10. Clarified that "document-natural-language" identifies the primary or first language if a Document contains more than one language.
11. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
12. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
13. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords) Printer Description attribute.

Version 0.9, 7 April 2003, agreements from the April 3 telecon:

1. Added "document-charset" (charset), "document-digital-signature" (type2 keyword), "document-format-version" (text(127)), and "document-natural-language" (naturalLanguage) Operation and Document Description attributes and corresponding "xxx-default" and "xxx-supported" Printer Description attributes.
2. Changed the "document-natural-language" member attribute of "document-format-details" (1setOf collection) operation attribute to be 1setOf, but kept the top level "document-natural-language" Operation attribute as single-valued.
3. Added Summary Table 2 of new Operation/Document Description attributes.
4. Defined CONDITIONALLY REQUIRED and CMUST Conformance Terms.
5. Deleted the "document-id-uri" Operation attribute no longer needed by PSI.
6. Changed "ipp-attribute-fidelity" so it doesn't affect operation attributes, so it is the same as in [rfc2911].



7. Clarified the operation attributes supplied at the Job Level in Print-Job and Print-URI versus Create-Job by introducing the "p" notation in Table 8.
8. Added columns to Table 8 to show the corresponding Document Description attributes and the "xxx-default" and "xxx-supported" Printer Description attributes.
9. Clarified that all of the new Operation attributes are hints, except "document-charset" and "document-format" and that the client can turn them into Must Honor by supplying their keyword attribute names in the "job-mandatory-attributes" Operation attribute.
10. Add the unique lang prefix from the Printer MIB to all "document-format-version" values, so that they can all be in a single flat list for the Printer's "document-format-version-supported" Printer Description attribute.

Version 0.10, May 1, 2003, agreements from the May 1 telecon:

1. Removed the conformance language from the Abstract.
2. Clarified that the "job-mandatory-attributes" can include keywords that the Printer doesn't support. The rejection occurs only if the client actually supplies the unsupported Template attribute in a request.
3. Clarified that a Print-Job is indistinguishable to Create-Job and one Send-Document.
4. Added that the Printer MUST reject a redundant Close-Job.
5. Clarified that the Printer MUST validate Create-Document in the context of the Job as a whole, including previous Documents in the same Job.
6. Split Table 7 of Operation Attributes into two. Show the syntaxes for the "xxx-default" and "xxx-supported" attributes in the first table.
7. Split the Print-Job/Print-URI from the Create-Job into two columns.
8. Added "output-device-requested" Operation attribute.
9. Added the Printer options (reject, hold, ignore) when the client supplies unsupported values in the Operation attributes for all but "compression", "document-charset", "document-format".
10. Use the 'application/vnd.PWG-XXX' for unregistered Printer MIB printer languages.
11. Added "output-device-requested (name(127) Operation/Job Description attribute for Job Creation operations.
12. Added "document-format-target" (mimeMediaType) and "document-format-version-target" (text(127) Job Template and Document Template attributes.
13. Clarified that a Document Template attribute share the "xxx-default" and "xxx-supported" Printer attribute values with the Job Template attribute of the same name.
14. Added that Document Template attributes MAY have corresponding "xxx-actual" Document Description attributes.
15. Added "document-format-version-detected" Document Description attribute.
16. Added 'digital-signature-did-not-verify', and 'digital-signature-type-not-supported', and [job-]errors-detected' to "job-state-reasons" and "document-state-reasons".
17. Added 'job-digital-signature-wait' to "job-state-reasons".

Version 0.11, May 9, 2003, agreements from the May 1 telecon:

18. Split the document up into 3 separate documents.
  - a. The Document Object extension to IPP
  - b. Job and Document extensions to IPP from IPPFAX, PSI and others
  - c. Future extensions