

1 Working Draft, September 8, 2003  
2 Maturity Level: Stable  
3  
4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

## The Printer Working Group (PWG) Standard for The Internet Printing Protocol (IPP): Job Extensions

**Abstract:** This IPP specification extends the Job semantics of the IPP Model and Semantics [rfc2911] object model. This specification defines some new Operation attributes for use in Job Creation and Document Creation operations. The Printer copies these Operation attributes to the corresponding Job Description attributes, which the clients may query. The Document Creation Operation attributes describe the Document Content and permit the Printer to reject requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-supported" Printer attributes are defined. This specification defines some Job Template attributes that apply to a multi-document Job as a whole and the "output-device" Job Template attribute that can apply to Documents and to Sheets as well as Jobs. This specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of the attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.



22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

Working Draft, September 8, 2003

# The Printer Working Group (PWG) Standard for The Internet Printing Protocol (IPP): Job Extensions

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

[ftp://ftp.pwg.org/pub/pwg/ipp/new\\_JOBX/wd-ippjobx10-20030908.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030908.pdf) , .doc, .rtf

33  
34  
35  
36  
37  
38

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/>.

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

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

46 Title: The Printer Working Group Standard for the Internet Printing Protocol (IPP): Job and Document  
47 Operation extensions

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

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

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

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

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

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

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

**69 About the IEEE-ISTO**

70

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

75

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

77

78

**79 About the IEEE-ISTO PWG**

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

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

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

93

94

**95 Contact information:**

96 IPP Web Page: <http://www.pwg.org/ipp/>

97 IPP Mailing List: [ipp@pwg.org](mailto:ipp@pwg.org)

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

99 1) send it to [majordomo@pwg.org](mailto:majordomo@pwg.org)

100 2) leave the subject line blank

101 3) put the following two lines in the message body:

102 subscribe ipp

103 end

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

109	<b>Contents</b>	
110	1 Introduction and Summary	8
111	1.1 Attributes Summary.....	8
112	2 Terminology	9
113	2.1 Conformance Terminology.....	9
114	2.2 Other Terminology .....	10
115	3 Operation Attributes for Job Creation and Document Creation operations	10
116	3.1 Operation attributes for Job Creation operations only .....	13
117	3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15).....	13
118	3.1.1.1 Why there are no "ipp-attribute-fidelity-default" and "ipp-attribute-fidelity-supported" attributes	13
119	3.1.2 job-mandatory-attributes (1setOf type2 keyword) .....	13
120	3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported" Printer	
121	Description attributes	14
122	3.2 Operation attributes for both Job and Document Creation operations .....	14
123	3.2.1 compression (type2 keyword).....	14
124	3.2.2 document-charset (charset).....	14
125	3.2.3 document-digital-signature (type2 keyword) .....	15
126	3.2.4 document-format (mimeMediaType) .....	16
127	3.2.5 document-format-details (1setOf collection).....	17
128	3.2.5.1 document-source-application-name (name(MAX))	18
129	3.2.5.2 document-source-application-version (text(127))	18
130	3.2.5.3 document-source-os-name (name(40))	18
131	3.2.5.4 document-source-os-version (text(40))	19
132	3.2.5.5 document-format (mimeMediaType)	19
133	3.2.5.6 document-format-device-id (text(127))	19
134	3.2.5.7 document-format-version (text(127))	19
135	3.2.5.8 document-natural-language (1setOf naturalLanguage)	19
136	3.2.6 document-format-version (text(127)).....	20
137	3.2.6.1 Why no "document-format-version-default"	20
138	3.2.7 document-message (text(MAX)).....	20
139	3.2.8 document-name (name(MAX)).....	21
140	3.2.9 document-natural-language (naturalLanguage).....	21
141	4 Job Template attributes	21
142	4.1 Job Template attributes defined for Job-wide effect in multi-document jobs.....	22
143	4.1.1 job-copies (integer(1:MAX)).....	22
144	4.1.1.1 job-copies-default (integer(1:MAX))	23
145	4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))	23
146	4.1.1.3 job-copies-actual (1setof Integer(1:MAX))	23
147	4.1.2 job-cover-back (collection).....	23
148	4.1.2.1 job-cover-back-default (collection)	23
149	4.1.2.2 job-cover-back-supported (1setOf type2 keyword)	23
150	4.1.2.3 job-cover-back-actual (1setOf collection)	23
151	4.1.3 job-cover-front (collection) .....	23
152	4.1.3.1 job-cover-front-default (collection)	24
153	4.1.3.2 job-cover-front-supported (1setOf type2 keyword)	24
154	4.1.3.3 job-cover-front-actual (1setOf collection)	24
155	4.1.4 job-finishings (1setOf type2 enum).....	24
156	4.1.4.1 job-finishings-default (1setOf type2 enum)	24
157	4.1.4.2 job-finishings-ready (1setOf type2 enum)	24

158 4.1.4.3 job-finishings-supported (1setOf type2 enum) 24

159 4.1.4.4 job-finishings-actual (1setOf type2 enum) 24

160 4.1.5 job-finishings-col (1setOf collection)..... 24

161 4.1.5.1 job-finishings-col-default (collection) 25

162 4.1.5.2 job-finishings-col-ready (collection) 25

163 4.1.5.3 job-finishings-col-supported (1setOf type2 keyword) 25

164 4.1.5.4 job-finishings-col-actual (1setOf collection) 25

165 4.2 Job Template attributes that may have Document Scope and Override Scope..... 25

166 4.2.1 output-device (name(127)) ..... 25

167 4.2.1.1 Why there is no output-device-default 25

168 4.2.1.2 output-device-supported (1setOf name(127)) 26

169 4.2.1.3 output-device-actual (1setOf name(127)) 26

170 4.2.2 print-content-optimize (type2 keyword) ..... 26

171 4.2.2.1 print-content-optimize-default (type2 keyword) 26

172 4.2.2.2 print-content-optimize-supported(1setOf type2 keyword) 26

173 4.2.2.3 print-content-optimize-actual (1setOf type2 keyword) 26

174 5 Job Description attributes 27

175 5.1 Job Description attributes that describe the Job as a whole..... 27

176 5.1.1 errors-count (integer(0:MAX))..... 28

177 5.1.2 ipp-attribute-fidelity (boolean) ..... 28

178 5.1.3 job-mandatory-attributes (1setOf type2 keyword) ..... 28

179 5.1.4 warnings-count (integer(0:MAX))..... 28

180 5.2 Job Description attributes that are defaults for the Document(s) in the Job..... 28

181 5.2.1 compression-supplied (type3 keyword) ..... 28

182 5.2.2 document-charset-supplied (charset) ..... 28

183 5.2.3 document-digital-signature-supplied (type2 keyword)..... 29

184 5.2.4 document-format-details-supplied (1setOf collection) ..... 29

185 5.2.5 document-format-supplied (mimeMediaType)..... 29

186 5.2.6 document-format-version-supplied (text(127)) ..... 29

187 5.2.7 document-message-supplied (text(MAX)) ..... 29

188 5.2.8 document-name-supplied (name (MAX)) ..... 29

189 5.2.9 document-natural-language-supplied (naturalLanguage) ..... 30

190 6 New values to existing attributes 30

191 6.1 New job-state-reasons(1setOf type2 keyword) Values..... 30

192 6.2 New media (type 3 keyword | name(MAX)) Values ..... 31

193 7 New Printer Description attributes 31

194 7.1 document-charset-default (charset) ..... 32

195 7.2 document-charset-supported (1setOf charset) ..... 32

196 7.3 document-digital-signature-default (type2 keyword) ..... 32

197 7.4 document-digital-signature-supported (1setOf type2 keyword) ..... 32

198 7.5 document-format-details-default (collection) ..... 32

199 7.6 document-format-details-supported (1setOf type2 keyword)..... 33

200 7.7 document-format-version-default (text(127)) ..... 33

201 7.8 document-format-version-supported (1setOf text(127)) ..... 33

202 7.9 document-natural-language-default (naturalLanguage) ..... 33

203 7.10 document-natural-language-supported (1setOf naturalLanguage) ..... 33

204	8	Status codes	34
205		8.1 server-error-too-many-jobs (0x050B).....	34
206		8.2 server-error-too-many-documents (0x050C) .....	34
207	9	Override Scope of Attributes	34
208		9.1 Override Scope of Job Template attributes .....	34
209		9.2 Scope for Operation attributes .....	35
210	10	Conformance Requirements	35
211		10.1 Printer conformance requirements.....	35
212		10.2 Client conformance requirements .....	36
213	11	Normative References	36
214	12	Informative References	37
215	13	IANA Considerations	39
216		13.1 Attribute Registrations.....	39
217		13.2 Keyword attribute values.....	41
218		13.3 Enum Attribute Values .....	42
219	14	Internationalization Considerations	43
220	15	Security Considerations	43
221	16	Contributors	43
222	17	Author's Address	43
223	18	Annex A: Additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate Standard	
224		[pwg5101.1] to add the new 'choice_xxx'	44
225	19	Annex B: Change Log (informative - to be removed before publication)	44
226			

227 **Table of Tables**

228	Table 1 - Summary of Job Creation Operation attributes .....	8
229	Table 2 - Summary of Job and Document Creation Operation attributes.....	9
230	Table 3 - Summary of Job Template Attributes.....	9
231	Table 4 - Operation, Default, and Supported Attributes.....	11
232	Table 5 - Operation Attributes supplied in Job and Document Creation Requests .....	12
233	Table 6 - "document-format-details" member Operation attributes.....	17
234	Table 7 - Job Template attributes .....	21
235	Table 8 - Job Description attributes that describe the Job as a whole.....	27
236	Table 9 - New "job-state-reasons" attribute values .....	30
237	Table 10 - New Printer Description attributes .....	32
238	Table 11 - Keyword values of "document-format-details-supported Printer attribute .....	33
239	Table 12 Override Scope for Job Template Attributes.....	34
240	Table 13 Scope for Operation Attributes.....	35
241		
242		

## 243 1 Introduction and Summary

244 This IPP specification is an assortment of attributes and values that extend the Job semantics of the IPP Model and  
 245 Semantics [rfc2911]. This specification defines some new Operation attributes for use in Job Creation and  
 246 Document Creation operations. The Printer copies these Operation attributes to the corresponding Job Description  
 247 attributes, which the clients may query. The Document Creation Operation attributes describe the Document Content  
 248 and permit the Printer to reject requests that it cannot process correctly. Some corresponding "xxx-default" and "xxx-  
 249 supported" Printer attributes are defined. This specification defines some Job Template attributes that apply to a  
 250 multi-document Job as a whole; their names start with "job-" to indicate their job-wide scope. This specification  
 251 defines the "output-device" Job Template attribute that can apply to Documents and to Sheets as well as Jobs. This  
 252 specification also defines some additional values for the "job-state-reasons" Job Description attribute. Each of the  
 253 attributes defined in this specification are independent of each other and are OPTIONAL for a Printer to support.

254 This specification is an IPP extension referenced by the PWG Semantic Model [pwg-sm]. The purpose for these  
 255 extensions is so that the print industry can have a common semantic specification for use in IPP, the PWG Semantic  
 256 Model [pwg-sm], the PWG Print Service Interface (PSI) project [pwg-psi], the PWG IPP Fax (IPPFAX) project  
 257 [ippfax], and the Free Standards Group Job Ticket API [fsg-jt].

### 258 1.1 Attributes Summary

259 Table 1 summarizes the Operation attributes defined in this specification for use with Job Creation operations. The  
 260 Printer copies these Operation attributes to corresponding Job Description attributes defined in this specification.

261 **Table 1 - Summary of Job Creation Operation attributes**

Operation attribute	Printer support	Description
ipp-attribute-fidelity (boolean)	MUST	Allows the client to control whether or not the Printer MUST support <i>all</i> Job Template attributes supplied in Job Creation operation, else the Printer MUST reject the job. Defined in [rfc2911] section 3.2.1.2 and 15.
job-mandatory-attributes (1setOf type2 keyword)	MAY	Allows the client to list the Job Template attributes that the Printer MUST support when supplied in the Job Creation operation, else the Printer MUST reject the job.

262 Table 2 summarizes the Operation attributes defined in this specification for use with Job Creation operations and  
 263 Send-Document and Send-URI operations. These Operation attributes allow the client to supply descriptions of the  
 264 Document Content to the Printer about individual Document Contents at request time. When supplied in a Job  
 265 Creation request, these Operation attributes provide defaults for the Document or Documents of the Job. When  
 266 supplied in a Document Creation operation, they describe the Document explicitly. This specification does *not* define  
 267 corresponding Document Description attributes, since this specification does not include or depend on a Document  
 268 object<sup>1</sup>.  
 269

<sup>1</sup> For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].



270

**Table 2 - Summary of Job and Document Creation Operation attributes**

Operation attribute	Printer support	Description
document-charset (charset)	MAY	The charset of the Document content
document-digital-signature (type2 keyword)	MAY	The type of digital signature, if any, used in the Document Content.
document-format-details (1setOf collection)	MAY	The details of the Document Content, including when it's a package of files (e.g., zip, multipart/related). The details include information, such as the application and the operating system that created the document, the intended device type (when the format is device-dependent), and the natural languages of the document.
document-format-version (text(127))	MAY	The version of the document format.
document-format-natural-language (naturalLanguage)	MAY	The primary natural language of the Document Content.

271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281

Table 3 summarizes the Job Template attributes defined in this specification for use with Job Creation operations. The Job Template attributes that have a "job-" prefix are defined to apply to the Job as a whole, independent of the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section 4.2.4), whose 'separate-documents-collated-copies' and 'separate-documents-uncollated-copies' values cause the Printer to produce separate Output Documents. The "output-device" Job Template attribute is not restricted to be job-wide and can be supplied in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 9). When supplied in a Document Creation operation, the "output-device" Job Template attribute describes the Document explicitly. This specification does *not* define corresponding Document Description attributes, since this specification does not include or depend on a Document object<sup>2</sup>.

282

**Table 3 - Summary of Job Template Attributes**

Job Template attribute	Printer support	Description
job-copies (integer(1:MAX))	MAY	The number of copies of the entire Job.
job-cover-back (collection)	MAY	The cover for the back of the entire Job.
job-cover-front (collection)	MAY	The cover for the front of the entire Job.
job-finishings (1setOf type2 enum)	MAY	The finishing for the entire Job.
job-finishings-col (1setOf collection)	MAY	The finishing characteristics for the entire Job.
output-device (name(127))	MAY	Allows the client to indicate a preference for output devices, for a Printer that supports one or more output device (see fan-out in [rfc2911] section 2.1).

283

## 2 Terminology

284

This section defines terminology used throughout this document.

285

### 2.1 Conformance Terminology

286  
287

Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, and **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [rfc2119].

<sup>2</sup> For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

## 288 2.2 Other Terminology

289 This document uses the same terminology as [rfc2911], such as “client”, “Printer”<sup>3</sup>, “attribute”, “attribute value”,  
 290 “keyword”, “Job Template attribute”, “Operation attribute”, “operation”, “request”, “response”, and “support”  
 291 (see [rfc2911] section 12.2.3) with the same meaning. In addition, the following terms are defined for use in this  
 292 document:

293 **Document Creation operation** - operations that accept Document Content. Specifically: Print-Job, Print-URI, Send-  
 294 Document and Send-URI. Note: Print-Job and Print-URI are both **Job Creation** and **Document Creation**  
 295 operations.

296 **Finished Document** - the result that the Printer produces on **Sheets** after the operations of printing, folding, cutting,  
 297 finishing, etc. are completed.

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

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

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

306 **Page** - The term “Page” used throughout this document is a synonym for PDL page.

307 **PDL Page** - A “PDL Page” is a page according to the definition of pages in the language used to express the  
 308 document data. Note: If the PDL contains multiple original source pages that have been placed on a single page by  
 309 the client application, then the PDL page count is one. On the other hand, if the client requests that multiple PDL  
 310 Pages are placed on a single side of media, by supplying “number-up” with a value greater than 1, then the PDL  
 311 page count will be more than one. [rfc2911] uses the term “print stream page” for PDL Page.

312 **Sheet** - A Sheet is the unit of media that a printer puts marks on. It is the most basic unit of output from a printer. A  
 313 printer may mark on one side or on both sides of a sheet.

## 314 3 Operation Attributes for Job Creation and Document Creation operations

315 This section defines Operation attributes for use in Job Creation operations and/or Document Creation operations  
 316 and as such describe characteristics of the Job and Document, rather than instructions to the Printer. For some of  
 317 these Operation attributes there are corresponding “xxx-default” and “xxx-supported” Printer Description attributes  
 318 (see section 7).

319 Table 4 lists the Operation attributes and their attribute syntaxes supplied in Job Creation and Document Creation  
 320 operations and the attribute syntaxes of their corresponding “xxx-default” and “xxx-supported” Printer Description  
 321 attributes, if any. A “-” indicates that there isn’t an “xxx-default” or “xxx-supported” Printer Description attribute.

---

<sup>3</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]. Nonetheless, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server.

322

**Table 4 - Operation, Default, and Supported Attributes**

<b>Operation attribute:</b> attribute name "xxx"	Operation attribute syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
<b>document-charset</b>	charset	charset	1setOf charset
<b>document-digital-signature</b>	type2 keyword	type2 keyword	1setOf type2 keyword
<b>document-format</b>	mimeMediaType	mimeMediaType	1setOf mimeMediaType
<b>document-format-details</b>	1setOf collection	1setOf collection	1setOf type2 keyword
<b>document-source-application-name</b>	name(MAX)	name(MAX)	-
<b>document-source-application-version</b>	text(127)	text(127)	-
<b>document-source-os-name</b>	name(40)	name(40)	-
<b>document-source-os-version</b>	text(40)	text(40)	-
<b>document-format</b>	mimeMediaType	mimeMediaType	-
<b>document-format-device-id</b>	text(127)	text(127)	-
<b>document-format-version</b>	text(127)	text(127)	-
<b>document-natural-language</b>	naturalLanguage	naturalLanguage	-
<b>document-format-version</b>	text(127)	text(127)	1setOf text(127)
<b>document-message</b>	text(MAX)	-	-
<b>document-name</b>	name(MAX)	-	-
<b>document-natural-language</b>	naturalLanguage	naturalLanguage	1setOf naturalLanguage
<b>ipp-attribute-fidelity</b>	boolean	-	-
<b>job-mandatory-attributes</b>	1setOf type2 keyword	-	-

323 Table 5 lists the Operation attributes that clients supply in Job and Document Creation operations and whether the  
 324 Printer copies (indicated by "⇒") the supplied value to the corresponding Job Description<sup>4</sup> attribute. The following  
 325 statements apply to all Operation attributes for Job and Document Creation operations and are *not* repeated in each  
 326 Operation attribute Description:

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

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

- 331 1. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if  
 332 defined (see Table 4 and section 7). If the Printer supports either of the "xxx-default" or "xxx-  
 333 supported" Printer Description attributes, then the Printer MUST also support the corresponding  
 334 Operation attribute.
- 335 2. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated  
 336 in the Printer's corresponding "xxx-supported" Printer Description attribute (see section 7). If the  
 337 values do not validate, the Printer MUST perform one of the actions indicated for that Operation  
 338 attribute, unless explicitly specified otherwise in the Description, such as (1) reject the request, (2)  
 339 accept the request and either (a) hold the job for operator intervention or (b) print the Job ignoring  
 340 the attribute. In all of these cases, the Printer MUST return the Operation attribute with the  
 341 unsupported value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

<sup>4</sup> The operations defined for Document Creation operations do not have corresponding Document Description attributes defined in this specification, since this specification does not assume that there is a Document object. See [ippdoc] for the corresponding Document Description attributes.

<b>Legend:</b>	
<b>“Operation”</b>	Column indicates the operation attribute names for Job and Document Creation requests.
<b>“**”</b>	Following attribute name indicates value sent on Create-Job, Print-Job and Print-Uri is the default for all the Documents in the Job.
<b>“Creation operations”</b>	Column indicates which operations the Operation attribute can be supplied in: PJ=Print-Job, PU=Print-URI, CJ=Create-Job, SD=Send-Document, and SU=Send-URI.
<b>“y”</b>	The Operation attribute is defined for use with the indicated operations.
<b>“y⇒”</b>	The Operation attribute is defined for use with the indicated operations. It has a corresponding Job Description attribute (see section 4.1.5.4) defined that the Printer MUST support and to which the Printer MUST copy this Operation attribute, if it supports the Operation attribute. See Table 4 for whether there are corresponding “xxx-default” and “xxx-supported” Printer Description attributes defined.
<b>“y⇒**”</b>	Same as above except the corresponding Job Description attribute has an “-supplied” suffix appended to the Operational attribute name.
<b>“-”</b>	the Operation attribute is <i>not</i> defined for the indicated operation.
<b>“Conformance”</b>	column indicates the conformance requirements for what the client supplies in a request and the Printer supports in a request. For (indented) member attributes, a MUST means if the collection attribute is supplied or supported.
<b>“Section”</b>	column indicates where the Operation attribute is defined in this spec.

342

343

**Table 5 - Operation Attributes supplied in Job and Document Creation Requests**

Operation attribute name	Attribute Syntax	Creation operations			Conformance		Section
		CJ	PJ, PU	SD, SU	Client supply	Printer support	
The following 10 Operation attributes have corresponding “xxx-supplied” Job Description attributes:							
<b>compression</b>	type2 keyword	y⇒**	y⇒**	y	MAY	MAY	§3.2.1
<b>document-charset*</b>	charset	y⇒**	y⇒**	y	MAY	MAY	§3.2.2
<b>document-digital-signature*</b>	type2 keyword	y⇒**	y⇒**	y	MAY	MAY	§3.2.3
<b>document-format*</b>	mimeMediaType	y⇒**	y⇒**	y	MAY	MUST	§3.2.4
<b>document-format-details*</b>	1 setOf collection	y⇒**	y⇒**	y	MAY	MAY	§3.2.5
<b>document-source-application-name*</b>	name(MAX)	y⇒	y⇒	y	MAY	MAY	§3.2.5.1
<b>document-source-application-version*</b>	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.5.2
<b>document-source-os-name*</b>	name(40)	y⇒	y⇒	y	MAY	MAY	§3.2.5.3
<b>document-source-os-version*</b>	text(40)	y⇒	y⇒	y	MAY	MAY	§3.2.5.4
<b>document-format*</b>	mimeMediaType	y⇒	y⇒	y	MUST	MUST	§3.2.5.5
<b>document-format-device-id*</b>	text(127)	y⇒	y⇒	y	MAY	MAY	§3.2.5.6
<b>document-format-version*</b>	text(127)	y⇒	y⇒	y	SHOULD	MUST	§3.2.5.7
<b>document-natural-language*</b>	naturalLanguage	y⇒	y⇒	y	MAY	MAY	§3.2.5.8
<b>document-format-version*</b>	text(127)	y⇒**	y⇒**	y	MAY	MAY	§3.2.6
<b>document-message*</b>	text(MAX)	y⇒**	y⇒**	y	MAY	MAY	§3.2.7
<b>document-name*</b>	name(MAX)	y⇒**	y⇒**	y	MAY	MUST	§3.2.8
<b>document-natural-language*</b>	naturalLanguage	y⇒**	y⇒**	y	MAY	MAY	§3.2.9
<b>ipp-attribute-fidelity</b>	boolean	y⇒	y⇒	-	MAY	MUST	§3.1.1,
<b>job-mandatory-attributes</b>	1 setOf type2 keyword	y⇒	y⇒	-	MAY	MAY	§3.1.2

344

## 345 **3.1 Operation attributes for Job Creation operations only**

346 This section defines additional operation attributes that the client MAY supply in Job Creation operations (Print-Job,  
347 Print-URI, and Create-Job) and Validate-Job, but not in Send-Document or Send-URI operations.

### 348 **3.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

349 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the client  
350 supplies unsupported Job Template attributes<sup>5</sup> or values in a Job Creation operation. The value 'true' indicates that  
351 total fidelity to client-supplied Job Template attributes and values is required for this Job Creation operation. If the  
352 client supplies the value 'false' or omits the attribute, then the Printer MUST accept the Job Creation operation.

353 The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 5.1.2).

#### 354 **3.1.1.1 Why there are no “ipp-attribute-fidelity-default” and “ipp-attribute-fidelity-supported” attributes**

355 Because [rfc2911] defines the default value to be 'false' there is no point to define an “ipp-attribute-fidelity-default”  
356 Printer Description attribute. Because [rfc2911] REQUIRES a Printer to support the “ipp-attribute-fidelity” Operation  
357 attribute there is no need for an “ipp-attribute-fidelity-supported” Printer Description attribute.

### 358 **3.1.2 job-mandatory-attributes (1setOf type2 keyword)**

359 This OPTIONAL Operation attribute permits the client to identify which Job Template attributes the Printer MUST  
360 support in this Job Creation request in order to accept the Job. The Printer MUST reject this Job Creation operation  
361 if the client supplies an unsupported Job Template attribute or value in the request that is also identified in this list.  
362 The client MAY supply the “job-mandatory-attributes” Operation attribute in a Job Creation operation or Validate-Job  
363 operation and MUST NOT supply this attribute in any other operation. If the Printer supports the “job-mandatory-  
364 attributes” Operation attribute, the Printer MUST support this attribute in all Job Creation operations that it supports  
365 and in the Validate-Job operation.

366 If the client supplies the “job-mandatory-attributes” Operation attribute and the ‘ipp-attribute-fidelity’ Operation  
367 attribute with the 'true' value, the Printer MUST ignore the “job-mandatory-attributes”, since the client is requesting  
368 that all of the supplied Job Template attributes in the Job Creation request MUST be supported in order for the  
369 Printer to accept the Job.

370 The Printer MUST copy this attribute to the corresponding “job-mandatory-attributes” Job Description attribute (see  
371 section 5.1.3) for auditing and trouble-shooting purposes<sup>6</sup>.

372 The values of the “job-mandatory-attributes” attribute are the keyword attribute names that identify Job Template  
373 attributes; for example, 'job-hold-until', 'job-finishings' (see section 4.1.3.3), 'copies' and 'media'. In order to identify a  
374 member attribute of a collection attribute, the keyword names of both the collection attribute and the member  
375 attribute are given separated by a period (.) character. For example, to make the “media” attribute of the “cover-  
376 front” collection attribute mandatory, supply the keyword value: 'cover-front.media'.

377 The Printer MUST accept *any* keyword values for the “job-mandatory-attributes” attribute itself whether or not the  
378 corresponding Job Template attributes are supported by the Printer and MUST NOT return any unsupported  
379 keywords in the Unsupported Attributes Group in the response. If the client supplies this “job-mandatory-attributes”  
380 Operation attribute in a Job Creation operation with values that represent Job Template attributes that the Printer

<sup>5</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 attributes supplied by the client.

<sup>6</sup> The Printer uses the “job-mandatory-attributes” Job Description attribute for validating subsequent Document Template attributes supplied in Send-Document and Send-URI operations for this job when also supporting [ippdoc], where the client can supply Document Template attributes.

381 doesn't support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject this Job Creation  
382 only if the client *actually supplies* any of the identified Job Template attributes that the Printer doesn't support.  
383 Because the Printer doesn't reject when the "job-mandatory-attributes" Operation attribute has unsupported attribute  
384 keyword names, the client MAY supply all of the attribute keyword names that the client supports without having to  
385 tailor the list to the particular Printer to which the client is submitting the Job Creation operation, thereby simplifying  
386 client use of this attribute.

387 Note: The "job-mandatory-attributes" has nothing to do with whether the Printer overrides the PDL with the identified  
388 Job Template attributes (see [rfc2911] sections 4.4.28 and 15).

### 389 **3.1.2.1 Why there are no "job-mandatory-attributes-default" and "job-mandatory-attributes-supported"** 390 **Printer Description attributes**

391 By definition, omission of the "job-mandatory-attributes" Operation attribute (and the "ipp-attribute-fidelity" Operation  
392 attribute with a 'false' value or omitted) means that the client is requesting that none of the supplied Job Template  
393 attributes need to be supported in order to accept the Job, i.e., the Printer MUST NOT reject the job because of any  
394 unsupported Job Template attributes. So the default is an empty list, so there is no point to have a "job-mandatory-  
395 attributes-default" Printer attribute.

396 By definition, the client can supply any Job Template attribute in the value list of the "job-mandatory-attributes"  
397 Operation attribute, whether or not the Printer actually supports that Job Template attribute. Therefore, it is not  
398 possible to have a "job-mandatory-attributes-supported" list, since all possible keywords would have to be expressed.

399 Note: the client MAY query the Printer's "job-creation-attributes-supported" (see [ippsave] section 7.1) and  
400 "document-creation-attributes-supported" (see [ippdoc] section 10.1) to see which Job Template and Document  
401 Template attributes the Printer actually supports.

## 402 **3.2 Operation attributes for both Job and Document Creation operations**

403 This section defines the semantics for the Operation attributes that a client MAY supply in a Job Creation operation  
404 (Print-Job, Print-URI, Create-Job) or a Document Creation operation (Print-Job, Print-URI, Send-Document and  
405 Send-URI). Note: Print-Job and Print-URI are both Job Creation and Document Creation operations.

### 406 **3.2.1 compression (type2 keyword)**

407 This REQUIRED Operation attribute identifies the compression used for the Documents in this Job and is defined in  
408 [rfc2911] section . It is included in this specification, because this specification defines the corresponding  
409 "compressions-supplied" Job Description attribute (see section 5.2.1).

### 410 **3.2.2 document-charset (charset)**

411 This OPTIONAL Operation attribute identifies the charset of the Document Content. This Operation attribute is  
412 intended to be supported by Printers that support a document-format in which the charset may be ambiguous in the  
413 Document content, such as 'application/vnd.hp-PCL', where the charset escape sequence MAY be omitted from the  
414 data.

415 If a client supplies the "document-charset" Operation attribute in a Document Creation operation with a value that the  
416 Printer doesn't support, the Printer MUST reject the job and return the status code: 'client-error-charset-not-  
417 supported' (see [rfc2911] section 3.1.4.14), since the interpretation of the content will be mis-understood by the  
418 Printer.

419 The standard values for these attributes are Internet Media types (sometimes called MIME types). For further details  
420 see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9.

421 The Printer MUST support this attribute if it supports a document format for which the Document Content can be  
 422 ambiguous with respect to the charset being used to encode the data. For example, the 'application/vnd.hp-PCL'  
 423 MAY omit the charset escape sequence. Although [rfc2854] strongly RECOMMENDS that 'text/html', include a "  
 424 charset=charset" parameter in the MIME type itself (that is, explicitly in the value of the "document-format" attribute),  
 425 often the charset= parameter is not present in the MIME type and the Printer MUST assume a charset. Thus a  
 426 Printer that supports the text/html MIME type MUST support the "document-charset" operation attributes. Also many  
 427 text files use the various 8-bit ISO 8859 charsets in which the lower half is US-ASCII and the upper half is various  
 428 Latin sets (about 8 or 9), Greek, Cyrillic, Hebrew, and Arabic. Shift JIS is another example where the left half is US-  
 429 ASCII, but the right half can be one of a number of things. But if the data doesn't contain the charset escape  
 430 sequences, this attribute can help the Printer know what the charset is in the Document. Such document formats are  
 431 called "charset-ambiguous" document formats. Finally, even though [rfc2046] REQUIRES the "  
 432 type parameter if the file contains other than US-ASCII, in practice, the "  
 433 omitted, thus making 'text/plain' a charset-ambiguous document format. See the discussion in [rfc2911] section 4.1.9  
 434 and [rfc2046].

435 The Printer MAY also check the Document content while processing to see that the document data meets the coding  
 436 requirements for the supplied charset. If the data contains something that is outside the charset encoding, the  
 437 Printer MUST either (1) hold the job or (2) abort, and SHOULD NOT continue printing square boxes for encoded  
 438 characters that are outside the charset supplied by the client.

439 Many other document formats, such as 'application/postscript' and 'application/pdf', are *not* charset-ambiguous, so  
 440 that Printers that support only such formats MAY omit support of the "document-charset" Operation/ Description  
 441 attributes.

442 If the Printer supports the "document-charset" Operation attribute, it MUST also support the corresponding  
 443 "document-charset-default" and "document-charset-supported" Printer Description attributes as well and vice versa  
 444 (see sections 7.1 and 7.2).

### 445 3.2.3 document-digital-signature (type2 keyword)

446 This OPTIONAL Operation attribute identifies the technology of digital signature in the Document content.

447 If a client supplies this "document-digital-signature" Operation attribute in a Document Creation operation with a  
 448 value that the Printer doesn't support, the Printer MUST perform one of the following actions depending on  
 449 implementation: (1) reject the request OR (2) accept the request, set the Job's "job-state-reasons" attribute to  
 450 'digital-signature-type-not-supported' (see section 6.1), and either (a) put the Job in the 'pending-held' state or (b)  
 451 process the job ignoring the attribute. See section 3 above for more details.

452 If the Printer supports this attribute and the value supplied by the client, the Printer MAY verify the signature  
 453 according to the rule for that signature format and "document-format". If the signature does not verify, then the  
 454 Printer MUST perform one of the following actions depending on implementation (which MAY depend on the  
 455 "document-format" and a site-established policy):

- 456 1. ignore the signature (and MAY indicate on the printed output some how) and MUST set the Job's "job-state-  
 457 reasons" Job Description attribute with the 'digital-signature-did-not-verify' value (see section 6.1).
- 458 2. put the job on hold and wait for human intervention and MUST set the Job's "job-state-reasons" Job  
 459 Description attribute with the 'job-digital-signature-wait' and 'digital-signature-did-not-verify' values (see  
 460 section 6.1), OR
- 461 3. abort the job depending on implementation and/or site configuration and MUST set the Job's "job-state-  
 462 reasons" Job Description attribute with the 'job-aborted-by-system' and 'digital-signature-did-not-verify'  
 463 values (see section 6.1).

464 Different PDLs have different techniques of embedding the signature. If the Printer supports the "document-digital-  
 465 signature" attribute and the supplied "document-format", the Printer MUST accept the document. However, if the  
 466 Printer either doesn't support the value of the "document-digital-signature" Operation attribute or doesn't support the  
 467 technique used by the supplied "document-format" attribute, the Printer MUST either (1) ignore the signature or (2)  
 468 put the job on hold and wait for human intervention, depending on implementation. If the Printer doesn't support the  
 469 supplied value, the Printer MUST return the "document-digital-signature" attribute with its value as unsupported in the  
 470 Unsupported Attributes group as specified in [rfc2911] section 3.1.7.

471 The following standard keyword values are defined:

472 'dss': Digital Signature Standard (DSS) [dss].

473 'none': There is not a digital signature in the Document content. If this attribute is supported, the 'none'  
 474 value MUST be implemented but MAY be removed by the administrator.

475 'pgp': PGP Message Exchange Formats [rfc1991].

476 'smime': Enhanced Security Services for S/MIME [rfc2634].

477 'xmldsig' XML Digital Signature [xmldsig].

### 478 3.2.4 document-format (mimeMediaType)

479 This REQUIRED Operation attribute (see [rfc2911] section 3.2.1.1) indicates the document format of the supplied  
 480 Document Content. If a client supplies the "document-format" Operation attribute with a value that the Printer doesn't  
 481 support, the Printer MUST reject the job and return the status code 'client-error-document-format-not-supported' (see  
 482 [rfc2911] section 3.1.4.11), since the Printer cannot process the data.

483 The standard values for this attribute are Internet Media types (sometimes called MIME types). For some MIME  
 484 types, such as 'text/plain' [rfc2046], the "; charset=" parameter is defined which specifies the charset of the Document  
 485 content. The Printer MUST support the charset MIME parameter as well as the "document-charset" Operation  
 486 attribute (section 3.2.2) if the Printer supports any text MIME type, such as 'text/plain' or 'text/html'. For further  
 487 details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section 4.1.9 and [rfc2046] and the  
 488 "document-charset" Operation attribute (section 3.2.2).

489 Many printer languages in the Printer MIB do not have a MIME type registered with IANA.<sup>7</sup> It is the intent of the PWG  
 490 to registers all of the Printer MIB v2 XXX Printer Languages as 'application/vnd.PWG-XXX'. If a Printer Language  
 491 already has a registered MIME Media type or gets a registration in the future, then that MIME Type MUST be used in  
 492 preference to the 'application/vnd.PWG-XXX' MIME Type. For example, PostScript® has the MIME Media type:  
 493 'application/postscript' and PCL has the MIME Media Type: 'application/vnd.HP-PCL', so those MIME Media types  
 494 MUST be used instead of 'application/vnd.PWG-PS' and 'application/vnd.PWG-PCL'. For example, the NEC NPDL  
 495 printer language from the Printer MIB does not have a MIME type registered with IANA. Therefore, the "document-  
 496 format" = 'application/vnd.PWG-NPDL' MUST be used.

497 Note: CIP4 did not agree to register MIME types for other organizations and standards. Instead, CIP4 will just add  
 498 values to the flat file that aren't MIME types. The values will not start with any of the MIME type roots: application/  
 499 audio/, image/, message/, model/, multipart/, test/, or video.

500 ACTION ITEM (Tom and Ira): Propose a format for the file.

501 See also the "document-format-version" Operation attribute in section 3.2.6 and the "document-format-details"  
 502 Operation attribute in section 3.2.5.

---

<sup>7</sup> Companies are urged to register there 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.



503 **3.2.5 document-format-details (1setOf collection)**

504 This OPTIONAL Operation attribute supplied in Document Creation operations summarizes the details of the  
 505 Document content, including any files contained in the Document. This Operation attribute is intended to be  
 506 supported by Printers that support a packaging document format, such as 'application/zip' or 'multipart/related', in  
 507 order to detail the contents. However, this Operation attribute MAY be used with any document format. See Table 6  
 508 for a list of the member attributes along with the client and Printer conformance requirements.

509 All member attributes, if supplied, MUST have contents. The value MUST NOT be omitted.

510 If a Printer supports a *packaging* MIME type, such as 'multipart/related' or 'application/zip', the Printer MUST support  
 511 this "document-format-details" Operation attribute. If a Printer does not support a packaging MIME type, it MAY omit  
 512 support of the "document-format-details" Operation attribute and Description attribute. The purpose of the  
 513 "document-format-details" Operation attribute is to describe the details of the document format or formats in the  
 514 supplied Document, including the packaging format itself, so that the Printer knows what to expect.

515 If a client supplies the "document-format-details" Operation attribute in a Document Creation request with member  
 516 attributes and/or values that the Printer doesn't support, the Printer MUST perform one of the following actions  
 517 depending on implementation: (1) reject the request OR (2) accept the request and either (a) put the Job in the  
 518 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for more details. However, if  
 519 the "document-charset" or the "document-format" member attributes are the ones in question, the Printer MUST  
 520 reject the request, same as for the "document-charset" and "document-format" Operation attributes (see sections  
 521 3.2.2 and 3.2.4) and return the 'client-error-charset-not-supported' (see [rfc2911] section 13.1.4.16) or the 'client-  
 522 error-document-format-not-supported' (see [rfc2911] section 13.1.4.11) status-codes, respectively.

523 For a packaging format, the "document-format-details" attribute does not provide means to associate each collection  
 524 value with particular document in the archive file, so it does not provide a "manifest"<sup>8</sup> of the packaging. One of the  
 525 packaging collection values MAY describe the packaging format itself, in which case that collection value MUST be  
 526 the first collection value. The remaining collection values provide the summary of the details of the contained files in  
 527 any order.

528 There MUST NOT be any duplicate collection values, that is, no collection values with all the same member attribute  
 529 values; it's a set, not a sequence. So 100 PostScript files with the same details in a .zip file:

530 (1) MAY have one collection value with the "document-format" member attribute = 'application/zip' MIME type  
 531 value and MAY have additional member attributes that give details about the .zip file itself and

532 (2) MUST have one collection value containing a "document-format" member attribute =  
 533 'application/postscript' and MAY have additional member attributes that give the details about the PostScript  
 534 files.

535 If a file in a packaging file is itself a packaging file, the single "document-format-details" (1setOf collection) Operation  
 536 attribute SHOULD contain the flattened distinct collection values for all files at all nested levels. Therefore, the  
 537 "document-format-details" collection attribute is not recursively defined and MUST NOT contain the "document-  
 538 format-details" attribute as a member attribute.

539 **Table 6 - "document-format-details" member Operation attributes**

Member Attribute Name	Attribute Syntax	Client supplies	Printer Support	Member Attribute	Top Level Attribute
-----------------------	------------------	-----------------	-----------------	------------------	---------------------

<sup>8</sup> If the client wants to achieve a "manifest", that is a complete list of each file in a packaging, then the client needs to extract each file from the package and submit each one in a separate Document Creation operation. Note: the client can re-compress each file before sending, so the compression isn't lost when sending each document separately.

				Section	Section
document-source-application-name	name(MAX)	MAY	MAY	3.2.5.1	N/A
document-source-application-version	text(127)	MAY	MAY	3.2.5.2	N/A
document-source-os-name	name(40)	MAY	MAY	3.2.5.3	N/A
document-source-os-version	text(40)	MAY	MAY	3.2.5.4	N/A
document-format	mimeMediaType	MUST	MUST	3.2.5.5	3.2.4
document-format-device-id	text(127)	MAY	MAY	3.2.5.6	N/A
document-format-version	text(127)	SHOULD	MUST	3.2.5.7	3.2.6
document-natural-languages	1setOf naturalLanguage	MAY	MAY	3.2.5.8	3.2.9

540  
 541 The client can determine which member attributes of the “document-format-details” are supported by querying the  
 542 Printer’s “document-format-details-supported” (1setOf type2 keyword) Printer Description attribute (see section 7.6).

543 Table 6 shows that three of the member attributes also have comparable top level Operation attributes defined with  
 544 the same names. See the sections listed in the rightmost column. These three high level attributes have  
 545 corresponding “xxx-default” and “xxx-supported” Printer Description attributes. These values are also for use with  
 546 the corresponding three member attributes. The remaining member attributes do not have any corresponding “xxx-  
 547 default” and “xxx-supported” Printer Description attribute.

548 If a client supplies this “document-format-details” Operation attribute with a member attribute with a value that the  
 549 Printer doesn’t support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept  
 550 the request and either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See  
 551 section 3 above for more details.

552 **3.2.5.1 document-source-application-name (name(MAX))**

553 This OPTIONAL member Operation attribute identifies the application that generated the document. The  
 554 value MUST be all lowercase in order to facilitate matching. The version number MUST NOT be included  
 555 (see the "document-source-application-version" attribute). Examples: “photoshop”, “microsoft word”,  
 556 “unknown”.

557 **3.2.5.2 document-source-application-version (text(127))**

558 This OPTIONAL member Operation attribute identifies the version number of the application that created the  
 559 document. The value MUST be all lowercase in order to facilitate matching. The intent of this attribute is for  
 560 purposes of affecting the interpreting by the Printer for any formats for which the source application version  
 561 might have different semantics. Examples:

562 “8.1 (4331)” for Winzip®, “5.0.5 10/26/2001” for Acrobat®, “2000 (9.0.4119 sr-1)” for Microsoft® Word

563 If the client omits this member attribute, that matches with any version. Similarly, the Printer’s member  
 564 attribute MAY be omitted or be a zero length string to indicate any.

565 **3.2.5.3 document-source-os-name (name(40))**

566 This OPTIONAL member Operation attribute identifies the name of the operating system on which the  
 567 document was generated. Valid values are the operating system names defined in the IANA Operating  
 568 System name registry [os-names] with the version number portion removed (see the “document-source-os-  
 569 version” attribute). IANA Operating System Names consist of up to 40 *uppercase* US-ASCII letters, hyphen  
 570 (“-“), period (“.”), and slash (“/“) characters. The value MUST be all lowercase in order to facilitate matching.

571 Possible example IANA OS Registry values: 'linux', 'macos', 'sun-os', 'unix', "unknown", 'windows'.

572 ACTION ITEM: Get Sun to register SOLARIS with IANA.(Tom H)

#### 573 **3.2.5.4 document-source-os-version (text(40))**

574 This OPTIONAL member Operation attribute identifies the version of the operating system on which the  
575 document was generated. Valid values include the version portion of any of the operating system names  
576 defined in the IANA Registry [os-names]. The value MUST be all lowercase in order to facilitate matching.  
577 The value MUST NOT include the name portion of the registered OS name (see "document-source-os-  
578 name" attribute).

579 Possible example values for the indicated "document-source-os-name" value are:

580 for 'linux': '1.0', '1.2', '2.0', '2.2', '2.4'

581 for 'unix': 'bsd', 'v', 'v.1', 'v.2', 'v.3', 'pc'

582 for 'windows': '95', '98', 'ce', 'nt', 'nt-2', 'nt-3', 'nt-3.5', 'nt-3.51', 'nt-4', 'nt-5' (windows 2000),

583 ACTION ITEM: Get Microsoft to register NT-5.1 (maybe NT-5.2) with IANA.(Ira M)

584

#### 585 **3.2.5.5 document-format (mimeMediaType)**

586 This REQUIRED member Operation attribute identifies the document format (see [rfc2911] §3.2.1.1) of the  
587 collection value of which it is a member. The client MUST supply and the Printer MUST support this member  
588 attribute in each collection value. The values for this member attribute are Internet Media types (sometimes  
589 called MIME types) and have the same values and semantics as for the top level "document-format"  
590 Operation attribute with the same name (see section 3.2.4 for the semantics).

#### 591 **3.2.5.6 document-format-device-id (text(127))**

592 This OPTIONAL member Operation attribute identifies the type of device for which the document was  
593 formatted, including manufacturer and model. This attribute is intended to identify document formats that are  
594 not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE  
595 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST NOT be specified. See  
596 the Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples.

597 Here is an example showing only the required fields for a PostScript document:

598 `MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;`

#### 599 **3.2.5.7 document-format-version (text(127))**

600 This REQUIRED member Operation attribute identifies the level or version of the document format identified  
601 by the "document-format" member attribute. The client MAY supply and the Printer MUST support this  
602 member attribute if the Printer supports the "document-format-details" Operation attribute. The semantics  
603 and supported values of this "document-format-version" member attribute MUST be the same as for the top  
604 level "document-format-version" Operation attribute with the same name (see section 3.2.6 for the  
605 semantics).

#### 606 **3.2.5.8 document-natural-language (1setOf naturalLanguage)**

607 This OPTIONAL member Operation attribute specifies the natural language(s) of the collection value of  
608 which it is a member. The values for this attribute are natural language codes (with optional country codes)  
609 and have the same values and semantics as for the top level "document-natural-language"  
610 (naturalLanguage) operation attribute with the same name (see section 3.2.9 for the semantics). If the  
611 document contains multiple natural languages, then the first value MUST be the primary language of the  
612 document.

### 613 3.2.6 document-format-version (text(127))

614 This OPTIONAL Operation attribute identifies the level or version of the document format of the Document content  
615 identified by the "document-format" Operation attribute (section 3.2.4).

616 If the client supplies this "document-format-version" Operation attribute, the client MUST also supply the "document-  
617 format" Operation attribute (section 3.2.4), so that the Printer does not need to parse the "document-format-version"  
618 string in order to determine the document format and version.

619 If a client supplies this "document-format-version" Operation attribute with a value that the Printer doesn't support as  
620 indicated by the Printer's "document-format-version-supported" attribute (see section 7.8), the Printer MUST perform  
621 one of the following actions, depending on implementation: (1) reject the request OR (2) accept the request and  
622 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for  
623 more details.

624 The defined values are taken from the Printer MIB [rfc1759] langTC values (after removing the "lang") used in the  
625 prtInterpreterLangFamily and the prtInterpreterLangLevel attributes (SNMP calls them "objects") separated by the "/"  
626 character. If there is no version, just the langTC prefix without the "/" is used. Note: the Printer MIB  
627 prtInterpreterLangVersion attribute is not used, since no standard values are given in the Printer MIB.

628 The short first field before the "/" character are unique, so that the version values are self-identifying so that all the  
629 versions for all document formats can be combined into a single list for the Printer's "document-format-version-  
630 supported" Printer attribute. The first field also tends to be the acronym for the document format and often is also the  
631 file name extension registered with IANA. The Printer MIB shows the first field in uppercase for readability.  
632 However, the Printer MUST perform case-insensitive matching of supplied values with supported values. If the  
633 common acronym includes a "-", such as TIFF/IT, the "/" is changed to "-" so that the first field ends with the first "/".

634 Example values:

635 'PS/3': For Postscript level 3 [rfc1759].  
636 'PCL/5e': For PCL 5e [rfc1759].  
637 'PDF/1.4': For PDF version 1.4 [pdf]  
638 'PDF/X-1a:2001': For PDF/X-1a [iso15930]  
639 'DCS/2.0' For Document Color Separation (DCS), version 2.0. [dcs2.0]  
640 'TIFF-IT/FP:1998': TIFF/IT [iso12639] - Full Page - baseline.  
641 'TIFF-IT/CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline  
642 'TIFF-IT/FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1  
643 'TIFF-IT/CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1  
644 'Automatic': auto sense the format [rfc1759]. Is use in combination with the 'application/octet-stream' (see  
645 [rfc2911] section 4.1.9.1) value of the "document-format" attribute (section 3.2.4).  
646

#### 647 3.2.6.1 Why no "document-format-version-default"

648 There is no "document-format-version-default" since to be meaningful, the default would have to depend on the  
649 "document-format". Currently, there are no "xxx-default" attributes whose values depend on the value of other  
650 attributes. Thus an implementation is free to supply its own defaults that depend on the "document-format".

### 651 3.2.7 document-message (text(MAX))

652 This OPTIONAL Operation attribute contains a message from the user to the operator about the Document.

653 **3.2.8 document-name (name(MAX))**

654 The Printer MUST support this Operation attribute in Print-Job, Print-URI, Send-Document, and Send-URI operations  
 655 (see [rfc2911 section 3.2.1.1) and MAY support it in the Create-Job operation. For the Print-Job, Print-URI, and  
 656 Create-Job operations, the Printer MUST copy the value to the corresponding Job Description attribute<sup>9</sup>.

657 **3.2.9 document-natural-language (naturalLanguage)**

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

660 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't  
 661 support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and  
 662 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 3 above for  
 663 more details.

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

- 667 'en': for English
- 668 'en-us': for US English
- 669 'fr': for French
- 670 'de': for German
- 671

672 **4 Job Template attributes**

673 Table 7 lists the new Job Template attributes defined in this specification. These Job Template attributes can be  
 674 supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations and the Validate-Job  
 675 operation.

676 Job Template attributes are OPTIONAL for a Printer to support and for a client to supply in a Job Creation request. If  
 677 a Printer supports a Job Template attribute, then the Printer MUST copy the supplied attribute to the Job object, so  
 678 that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs operations (see [rfc2911] section  
 679 4.2). In addition, as in [rfc2911], for each "xxx" Job Template attribute supported, the Printer MUST support the  
 680 corresponding "xxx-default" and "xxx-supported" Printer attributes, if defined.

681 **Table 7 - Job Template attributes**

Job Template attribute name "xxx"	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
job-copies	integer(1:MAX)	integer(1:MAX)	rangeOfInteger(1:MAX)

<sup>9</sup> For the Send-Document and the Send-URI Operation attribute, the Printer copies them to the corresponding Document Description attribute defined in [ippdoc].

<b>Job Template attribute name "xxx"</b>	Attribute Syntax	Printer: Default Value attribute syntax "xxx-default"	Printer: Supported Values attribute syntax "xxx-supported"
<b>job-cover-back</b>	collection	collection	1setOf type2 keyword
<b>cover-type</b>	type2 keyword	-	1setOf type2 keyword
<b>media</b>	type3 keyword   name(MAX)	-	1setOf (type3 keyword   name(MAX))
<b>media-col</b>	collection	-	1setOf type2 keyword
<i>member attributes [pwg5100.3]</i>	See [pwg5100.3]	-	-
<b>job-cover-front</b>	collection	collection	1setOf type2 keyword
<i>member attributes - same as job-cover-back</i>	see job-cover-back		
<b>job-finishings</b>	1setOf type2 enum	1setOf type2 enum <sup>10</sup>	1setOf type2 enum
<b>job-finishings-col</b>	collection	collection <sup>10</sup>	1setOf type2 keyword
<b>finishing-template</b>	name(MAX)	-	1setOf name(MAX)
<b>stitching</b>	collection		1setOf type2 keyword
<b>stitching-reference-edge</b>	type2 keyword	-	1setOf type2 keyword
<b>stitching-offset</b>	integer (0:MAX)	-	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))
<b>stitching-locations</b>	1setOf integer(0:MAX)	-	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))
<b>output-device</b>	name(127)	-	1setOf name(127)
<b>print-content-optimize</b>	<b>type2 keyword</b>	<b>type2 keyword</b>	1setOf type2 keyword

## 682 4.1 Job Template attributes defined for Job-wide effect in multi-document jobs

683 This section defines additional Job Template attributes that have Job-wide effect and so are intended for use in the  
684 creation of multi-document Jobs. These Job Template attributes have the "job-" prefix to indicate their Job wide  
685 scope. When clients supply these job-wide Job Template attributes, they MUST supply these attributes in Job  
686 Creation and Validate-Job operations only. Clients MUST NOT supply these Job Template attributes as Document  
687 Template attributes in the Send-Document and Send-URI operations ([ippdoc]) or in any other operations. Note that  
688 clients do not supply these attributes as member attributes of the "overrides" Job Template attribute (See  
689 [ippOverride]).

### 690 4.1.1 job-copies (integer(1:MAX))

691 This OPTIONAL Job Template attribute specifies the number of job copies, i.e., with all of the Documents taken  
692 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.  
693 See the "copies" Job Template attribute defined in [rfc2911] section 4.2.5 that switches between job copies and  
694 document copies depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]  
695 section 4.2.4).

696 For example assume a Job has two documents. The "copies" attribute has a value of '3' and "job-copies" has a  
697 value of '2'. With "multiple-document-handling" set to 'separate-documents-collated-copies' the resulting printout  
698 would have two sets (i.e. job-copies=2). The first set would be 3 copies of Document 1 and then 3 copies of  
699 Document 2. The second set would be identical to the first. If a similar Job was run with "multiple-documents-  
700 handling" set to 'single-document-new-sheet' it would also produce two set. In this case however each set would  
701 contain Document 1, Document 2, Document 1, Document 2, Document 1, Document 2 (i.e copies=3). The "copies"  
702 and "job-copies" become more interesting when Documents within the Job each have their own value of "copies".  
703 This can be accomplished via the Document object [ippdoc] or Overrides [PWG5100.4], [ippOverride].

<sup>10</sup> The "job-finishings" and "job-finishings-col" Job Template attributes also include corresponding "job-finishings-ready" (1setOf type 2 enum) and "job-finishings-col-ready" (1setOf collection) attributes.

**704 4.1.1.1 job-copies-default (integer(1:MAX))**

705 This OPTIONAL Job Template Printer attribute specifies the default number of copies for the job as a whole. The  
706 Printer MUST support this attribute if it supports the "job-copies" Job Template attribute.

**707 4.1.1.2 job-copies-supported (rangeOfInteger(1:MAX))**

708 This OPTIONAL Job Template Printer attribute specifies the supported range of the number of copies for the job as a  
709 whole. The Printer MUST support this attribute if it supports the "job-copies" Job Template attribute.

**710 4.1.1.3 job-copies-actual (1setof Integer(1:MAX))**

711 This OPTIONAL Job Description attribute specifies the number of copies that the Printer actually printed for the job  
712 as a whole. The Printer MAY support this attribute even if it does not support the "job-copies" Job Template attribute.

**713 4.1.2 job-cover-back (collection)**

714 This OPTIONAL Job Template attribute specifies the cover for the back of the job, i.e., with all of the Documents  
715 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The  
716 member attributes are the same as "cover-back" (see [pwg5100.3] section 3.1) and with the same conformance  
717 requirements. However, the "cover-back" Job Template attribute switches between a job back cover and a document  
718 back cover depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911] section  
719 4.2.4). The "job-cover-back" Job Template attribute is equivalent to "cover-back" with "multiple-document-handling" =  
720 'single-document-new-sheet'.

**721 4.1.2.1 job-cover-back-default (collection)**

722 This OPTIONAL Job Template Printer attribute specifies the default the cover for the back of the job. The Printer  
723 MUST support this attribute if it supports the "job-cover-back" Job Template attribute.

**724 4.1.2.2 job-cover-back-supported (1setOf type2 keyword)**

725 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-cover-back"  
726 Job Template collection attributes. The Printer MUST support this attribute if it supports the "job-cover-back" Job  
727 Template attribute.

**728 4.1.2.3 job-cover-back-actual (1setOf collection)**

729 This OPTIONAL Job Description attribute specifies the "job-cover-back" that the Printer actually used in producing  
730 the job. The Printer MAY support this attribute even if it does not support the "job-cover-back" Job Template  
731 attribute.

**732 4.1.3 job-cover-front (collection)**

733 This OPTIONAL Job Template attribute specifies the cover for the front of the job, i.e., with all of the Documents  
734 taken together and is independent of the value of the "multiple-document-handling" Job Template attribute. The  
735 member attributes are the same as the "cover-front" Job Template attribute (see [pwg5100.3] section 3.2) and with  
736 the same conformance requirements. However, the "cover-front" Job Template attribute switches between a job  
737 front cover and a document front cover depending on the value of the "multiple-document-handling" Job Template  
738 attribute ([rfc2911] section 4.2.4). The "job-cover-front" Job Template attribute is equivalent to "cover-front" with  
739 "multiple-document-handling" = 'single-document-new-sheet'.

**740 4.1.3.1 job-cover-front-default (collection)**

741 This OPTIONAL Job Template Printer attribute specifies the default the cover for the front of the job. The Printer  
742 MUST support this attribute if it supports the "job-cover-front" Job Template attribute.

**743 4.1.3.2 job-cover-front-supported (1setOf type2 keyword)**

744 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-cover-front" Job  
745 Template attributes. The Printer MUST support this attribute if it supports the "job-cover-front" Job Template  
746 collection attribute.

**747 4.1.3.3 job-cover-front-actual (1setOf collection)**

748 This OPTIONAL Job Description attribute specifies the "job-cover-front" that the Printer actually used in producing  
749 the job. The Printer MAY support this attribute even if it does not support the "job-cover-front" Job Template  
750 attribute.

**751 4.1.4 job-finishings (1setOf type2 enum)**

752 This OPTIONAL Job Template attribute specifies the job finishings, i.e., with all of the Documents taken together. Its  
753 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the  
754 "finishings" Job Template attribute defined in [rfc2911] section 4.2.6 that switches between job finishings and  
755 document finishings depending on the value of the "multiple-document-handling" Job Template attribute ([rfc2911]  
756 section 4.2.4). The "job-finishings" Job Template attribute is equivalent to "finishings" with "multiple-document-  
757 handling" = 'single-document-new-sheet'.

**758 4.1.4.1 job-finishings-default (1setOf type2 enum)**

759 This OPTIONAL Job Template Printer attribute specifies the default job finishings. The Printer MUST support this  
760 attribute if it supports the "job-finishings" Job Template attribute.

**761 4.1.4.2 job-finishings-ready (1setOf type2 enum)**

762 This OPTIONAL Job Template Printer attribute specifies the ready job finishings, that is, the job finishings that maybe  
763 used without operator intervention. The Printer MUST support this attribute if it supports the "job-finishings" Job  
764 Template attribute.

**765 4.1.4.3 job-finishings-supported (1setOf type2 enum)**

766 This OPTIONAL Job Template Printer attribute specified the supported job finishings values. The Printer MUST  
767 support this attribute if it supports the "job-finishings" Job Template attribute.

**768 4.1.4.4 job-finishings-actual (1setOf type2 enum)**

769 This OPTIONAL Job Description attribute specifies the "job-finishings" that the Printer actually used in producing the  
770 job. The Printer MAY support this attribute even if it does not support the "job-finishings" Job Template attribute.

**771 4.1.5 job-finishings-col (1setOf collection)**

772 This OPTIONAL Job Template attribute specifies the job finishings collection, i.e., with all of the Documents taken  
773 together. Its interpretation is independent of the value of the "multiple-document-handling" Job Template attribute.  
774 See the "finishings-col" Job Template attribute defined in [pwg5100.3] section 3.2 that switches between job  
775 finishings collection and document finishings collection depending on the value of the "multiple-document-handling"



776 Job Template attribute ([rfc2911] section 4.2.4). The "job-finishings-col" Job Template attribute is equivalent to  
777 "finishings-col" with "multiple-document-handling" = 'single-document-new-sheet'.

#### 778 4.1.5.1 job-finishings-col-default (collection)

779 This OPTIONAL Job Template Printer attribute specifies the default job finishings collection. The Printer MUST  
780 support this attribute if it supports the "job-finishings-col" Job Template attribute.

#### 781 4.1.5.2 job-finishings-col-ready (collection)

782 This OPTIONAL Job Template Printer attribute specifies the ready job finishings collection, that is, the job finishings  
783 collection that maybe used without operator intervention. The Printer MUST support this attribute if it supports the  
784 "job-finishings-col" Job Template attribute.

#### 785 4.1.5.3 job-finishings-col-supported (1setOf type2 keyword)

786 This OPTIONAL Job Template Printer attribute specified the supported member attributes of the "job-finishings-col"  
787 Job Template collection attribute. The Printer MUST support this attribute if it supports the "job-finishings-col" Job  
788 Template attribute.

#### 789 4.1.5.4 job-finishings-col-actual (1setOf collection)

790 This OPTIONAL Job Description attribute specifies the "job-finishings-col" attributes that the Printer actually used in  
791 producing the job. The Printer MAY support this attribute even if it does not support the "job- finishings-col " Job  
792 Template attribute.

## 793 4.2 Job Template attributes that may have Document Scope and Override Scope

794 This section defines additional Job Template attributes that are *not* restricted to job-wide scope and MAY be supplied  
795 in Document Creation operations and in the "override" attribute to override at the Sheet level (see section 9). When  
796 supplied in a Document Creation operation, these Job Template attributes describes the Document explicitly. This  
797 specification does *not* define corresponding Document Description attributes, since this specification does not include  
798 or depend on a Document object<sup>11</sup>.

### 799 4.2.1 output-device (name(127))

800 This OPTIONAL Job Template attribute specifies the name of the target output device for a Printer that fans-out to  
801 multiple devices (see [rfc2911] section 2.1). This allows the client to control which output device the Printer selects.  
802 If this Job Template attribute is omitted, the Printer selects whichever output device seems best for the job in an  
803 implementation dependent manner. Note that "output-device" can be applied at the Job, Document, Document-Copy  
804 or Page level.

#### 805 4.2.1.1 Why there is no output-device-default

806 There is no "output-device-default" Printer attribute. A Printer MAY have a dynamic scheduling algorithm to assign  
807 jobs to output devices, in which case the "output-device-supported" Printer attribute would have multiple values. A  
808 client that did not supply an explicit "output-device" is asking the Printer to choose the most appropriate output  
809 device(s) (i.e. physical printer(s)) to print the Job. If "output-device-default" was allowed there would be no way to  
810 request this since the default output device would be assigned when it was not supplied by the client. If the Printer

---

<sup>11</sup> For Document Description attributes that correspond to the Operation attributes defined for Document Creation operations, see the Document object defined in [ippdoc].

811 does not have a dynamic scheduling algorithm to assign Jobs to output devices, the Printer would populate "output-  
812 device-supported" with only one value.

#### 813 **4.2.1.2 output-device-supported (1setOf name(127))**

814 This OPTIONAL Job Template Printer attribute specifies the supported "output-device" values. The Printer MUST  
815 support this attribute if it supports the "output-device" Job Template attribute.

#### 816 **4.2.1.3 output-device-actual (1setOf name(127))**

817 This OPTIONAL Job Description attribute specifies the output-device(s) that the Printer actually used to produce the  
818 job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the "output-device "  
819 Job Template attribute. The "output-device-actual" attribute MAY have more than one value, while the [rfc2911]  
820 "output-device-assigned" Job Description attribute has only a single name(127) value.

821 For example printers that automatically splits Jobs between OutputDevices can indicate the location of the pages of  
822 the Job via this element This can occur if the Printer automatically routes Pages to the appropriate output device or  
823 "output-device" is included in an "override" or applied to individual Documents within the Job.

### 824 **4.2.2 print-content-optimize (type2 keyword)**

825 This OPTIONAL Job Template attribute refines the value specified by the "print-quality" ([rfc2911] §4.2.13) attribute.  
826 The "print-quality" attribute specifies the level of quality. The "print-content-optimize" attribute directs the type of  
827 optimization/processing that will be performed on the Document content. It does not necessarily mean the value  
828 describes the content.

829 The standard keyword values are:

- 830 • 'photo': optimize for photographic clarity
- 831 • 'graphics': optimize for graphic clarity such as graphs and line drawings
- 832 • 'text': optimize for text clarity
- 833 • 'text-and-graphics': optimize for both text and graphic clarity

#### 834 **4.2.2.1 print-content-optimize-default (type2 keyword)**

835 This OPTIONAL Job Template Printer attribute specifies the default "print-content-optimize" value. The Printer  
836 MUST support this attribute if it supports the "output-device" Job Template attribute.

#### 837 **4.2.2.2 print-content-optimize-supported(1setOf type2 keyword)**

838 This OPTIONAL Job Template Printer attribute specifies the supported "print-content-optimize" values. The Printer  
839 MUST support this attribute if it supports the "output-device" Job Template attribute.

#### 840 **4.2.2.3 print-content-optimize-actual (1setOf type2 keyword)**

841 This OPTIONAL Job Description attribute specifies the "print-content-optimize "(s) that the Printer actually used to  
842 produce the job [ippact]. The Printer MAY support this Job Description attribute even if it does not support the " print-  
843 content-optimize " Job Template attribute. Note: The "print-content-optimize -actual" attribute MAY have more than  
844 one value, while the "print-content-optimize" Job Description attribute has only a single value.

845

846 **5 Job Description attributes**

847 This section defines the new Job Description attributes defined in this IPP specification. Job Description attributes  
 848 are Job object attributes that are filled in by the Printer. Some Job Description attribute values are supplied by the  
 849 client in the Job operation using corresponding Operation attributes as indicated in the "Set by" column. The Printer  
 850 MUST NOT support modification of any of these Job Description attributes using the Set-Job-Attributes operation  
 851 ([rfc3380]).

852 This section divides Job Descriptions into two subsections: Section 5.1 contains Job Description attributes that  
 853 describe the Job as a whole and Section 5.2 contains Job Description attributes that are defaults for the Document(s)  
 854 in the Job<sup>12</sup>. The following legend is used in the tables in both sections:

<b>Legend:</b>	
<b>IPP Attribute Syntax</b>	the attribute syntax (see [rfc2911] section 4.1).
<b>Set by</b>	indicates whether the value is set by the client or Printer in the Job Creation operation: <b>client</b> - means that the Printer MUST populate this Job Description attribute by copying <i>from</i> the corresponding Operation attribute that the client MAY supply in the Job Creation operation. See Table 5 for the corresponding Operation attribute. <b>Printer</b> - means that the Printer sets the value based on the state of the Printer.
<b>Printer conformance</b>	indicates MUST or MAY for Printer conformance.
<b>Reference</b>	references either to a sub-section of this specification or to a section in another specification, where further information about this attributes can be found.

855

856 **5.1 Job Description attributes that describe the Job as a whole**

857 This section defines those Job Description attributes that describe the Job as a whole. See section 5.2 below for  
 858 those Job Description attributes that are defaults for the Document or Documents in the Job.

859 **Table 8 - Job Description attributes that describe the Job as a whole**

Job Description attribute name	IPP Attribute Syntax	Set by	Printer conformance	Reference
<b>errors-count</b>	integer(0:MAX)	Printer	MAY	§5.1.1
<b>ipp-attribute-fidelity</b>	boolean	client	MAY	§5.1.2
<b>job-mandatory-attributes</b>	1setOf type2 keyword	client	MAY	§5.1.3
<b>output-device-assigned</b>	name(127)	Printer	MAY	[rfc2911] §4.3.7.2
<b>warnings-count</b>	integer(0:MAX)	Printer	MAY	§5.1.4

860

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

<sup>12</sup> The [jobx] specification does not define any Document Description attributes. See the [ippdoc] specification.

### 869 **5.1.1 errors-count (integer(0:MAX))**

870 This OPTIONAL Job Description attribute counts the number of errors encountered processing the job as a whole.  
871 An error where some portion of the printed output is not present, such as a glyph encountered which isn't in the  
872 Printer's font or an image in a page was in a format that the Printer didn't support, though the Printer did support the  
873 overall document format.

### 874 **5.1.2 ipp-attribute-fidelity (boolean)**

875 This OPTIONAL Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation  
876 attribute ([rfc2911] section 3.2.1.1)<sup>13</sup> that the client supplied in the Job Creation operation. This Job Description  
877 attribute has no effect on the processing of the job once the Job Creation operation has been accepted<sup>14</sup>. However,  
878 this attribute does provide an audit capability to the user and service desk for comparing unexpected printed results  
879 with what was submitted.

### 880 **5.1.3 job-mandatory-attributes (1setOf type2 keyword)**

881 This OPTIONAL Job Description attribute indicates which Job Template attributes that the client required that the  
882 Printer Support in order to accept the Job Creation request. The Printer populates this attribute with the value of the  
883 corresponding "job-mandatory-attributes" Operation attribute (see section 3.1.2) supplied by the client in the Job  
884 Creation operation. This Job Description attribute has no effect on the processing of the job once the Job Creation  
885 operation has been accepted<sup>14</sup>. However, this Job Description attribute does provide an audit capability of the Job  
886 object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for comparing unexpected  
887 printed results with what was submitted. See section 3.1.2 for additional details of the semantics of this "job-  
888 mandatory-attributes" Operation attribute that are not repeated here.

### 889 **5.1.4 warnings-count (integer(0:MAX))**

890 This OPTIONAL Job Description attribute counts the number of warnings encountered processing the job as a whole.  
891 A warning is where no information is lost, but the appearance of the printed output MAY not be as expected.

## 892 **5.2 Job Description attributes that are defaults for the Document(s) in the Job**

893 This section defines those Job Description attributes that provide defaults for the Document Or Documents in the  
894 Job. See section 5.1 above for those Job Description attributes that describe the Job as a whole.

### 895 **5.2.1 compression-supplied (type3 keyword)**

896 This REQUIRED Job Description attribute specifies the *default* compression used to represent the document(s) in  
897 the Job. The Printer sets this Job Description attribute from the corresponding Operation attribute (see [rfc2911]  
898 §3.2.1.1) supplied by the client in the Job Creation operation.

### 899 **5.2.2 document-charset-supplied (charset)**

900 This OPTIONAL Job Description attribute specifies the *default* charset used to represent this document (see section  
901 3.2.2). The Printer sets this Job Description attribute from the corresponding Operation attribute supplied by the  
902 client in the Job Creation operation.

---

<sup>13</sup> The "ipp-attribute-fidelity" attribute is defined only as an Operation attribute in [rfc2911]. This specification is defining it as a Job Description attribute as well which the Printer MAY support.

<sup>14</sup> The "ipp-attribute-fidelity" and "job-mandatory-attributes" Operation attributes do have effect after the Job Creation operation when the Document Object is supported [ippdoc].

### 903 **5.2.3 document-digital-signature-supplied (type2 keyword)**

904 This OPTIONAL Job attribute specifies the *default* digital signature technology used in the Document content. The  
905 Printer sets this Job Description attribute from the corresponding “document-digital-signature” Operation attribute  
906 (see section 3.2.3 for the semantics), if supplied by the client in the Job Creation operation. If a Printer supports the  
907 “document-digital-signature” Operation attribute, the Printer MUST support this “document-digital-signature” Job  
908 Description attribute.

### 909 **5.2.4 document-format-details-supplied (1setOf collection)**

910 This OPTIONAL Job Description attribute specifies the *default* details of the document format(s) of the Document  
911 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-details”  
912 Operation attribute (see section 3.2.5 for the semantics), if supplied by the client in the Job Creation operation. If a  
913 Printer supports the “document-format-details” Operation attribute, the Printer MUST support this “document-format-  
914 details” Job Description attribute.

### 915 **5.2.5 document-format-supplied (mimeMediaType)**

916 This REQUIRED<sup>15</sup> Job Description attribute specified the *default* document format of the Document Object content.  
917 The Printer sets this Job Description attribute from the corresponding “document-format” Operation attribute (see  
918 [rfc2911] section 3.2.1.1 and [this spec] section 3.2.4 for the semantics), if supplied by the client in the Job Creation  
919 operation.

### 920 **5.2.6 document-format-version-supplied (text(127))**

921 This OPTIONAL Job Description attribute specifies the *default* version of the document format of the Document  
922 Object content. The Printer sets this Job Description attribute from the corresponding “document-format-version”  
923 Operation attribute (see section 3.2.6 for the semantics), if supplied by the client in the Job Creation operation (see  
924 section ). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this  
925 “document-format-version” Job Description attribute.

### 926 **5.2.7 document-message-supplied (text(MAX))**

927 This OPTIONAL Job Description contains either (1) the *default* message from the user to the operator about the  
928 Document(s) or (2) a message from the operator, system administrator, or "intelligent" process to indicate to the end  
929 user the reasons for modification or other management action taken on the Document. The Printer populates this  
930 Job Description attribute from the “document-message” (text(MAX) Operation attribute value (see section 3.2.7)  
931 supplied by the client in the Job Creation operation.

932 In addition, the user and the operator can set the value of this Job Description attribute explicitly using the Set-Job-  
933 Attributes operation (see [rfc3380]).

### 934 **5.2.8 document-name-supplied (name (MAX))**

935 This REQUIRED Job Description attribute specifies the *default* name of the document (see [rfc2911] §3.2.1.1). The  
936 Printer sets this Job Description attribute from the corresponding Operation attribute (see section 3.2.8) supplied by  
937 the client in the Job Creation operation.

---

<sup>15</sup> [rfc2911] did not define a “document-format” Document Description attribute; it is a new attribute defined in this specification.

## 938 5.2.9 document-natural-language-supplied (naturalLanguage)

939 This OPTIONAL Job Description attribute specifies the *default* primary natural language of the Document content  
 940 (see [rfc2911] section 3.2.1.1). The Printer sets this Job Description attribute from the corresponding Operation  
 941 attribute (see section 3.2.9) supplied by the client in the Job Creation operation.

## 942 6 New values to existing attributes

943 This section defines new values for existing attributes.

### 944 6.1 New job-state-reasons(1setOf type2 keyword) Values

945 The REQUIRED "job-state-reasons" Job Description attributes ([rfc2911] section 4.3.8) provide additional information  
 946 about the job's current state, i.e., information that augments the value of the job's "job-state" attribute.

947 These new values MAY be used with any job state for which the reason makes sense. When implemented, the  
 948 Printer MUST return these values when the reason applies and MUST NOT return them when the reason no longer  
 949 applies whether the value of the Job's "job-state" attribute changed or not. When the Job does not have any reasons  
 950 for being in its current state, the value of the Job's "job-state-reasons" attribute MUST be 'none'.

951 Note: While values cannot be added to the "job-state" attributes without impacting deployed clients that take actions  
 952 upon receiving "job-state" values, it is the intent that additional "job-state-reasons" values can be defined and  
 953 registered without impacting such deployed clients. In other words, the "job-state-reasons" attribute are intended to  
 954 be extensible.

955 Table 9 lists the new keyword values for the "job-state-reasons" attribute defined in this specification as indicated in  
 956 the References column. In Table 9 the keywords are listed in alphabetic order, while in their descriptions following  
 957 Table 9, they are listed in the most likely order of occurrence to help understanding.

958 **Table 9 - New "job-state-reasons" attribute values**

IPP Job Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
<b>job-state-reasons</b>	1setOf type2 keyword	MUST	[rfc2911] §4.3.8
	digital-signature-did-not-verify	MAY	[this spec] §6.1
	digital-signature-type-not-supported	MAY	[this spec] §6.1
	errors-detected	MAY	[this spec] §6.1
	job-digital-signature-wait	MAY	[this spec] §6.1
	warnings-detected	MAY	[this spec] §6.1

959 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely  
 960 to occur (if implemented):  
 961

962 **'digital-signature-type-not-supported'**: One or more documents in the Job contain a digital signature type  
 963 that is not supported. Implementation or site policy determines the state of the Job once this  
 964 condition is detected.

965 **'job-digital-signature-wait'**: The Job is currently being held because the Job was submitted with a  
 966 "document-digital-signature" attribute value that is not supported.

967 **'digital-signature-did-not-verify'**: One or more documents in the Job contains a digital signature type that is  
 968 supported (see section 3.2.3), but the signature did not verify when the Printer attempted to verify the  
 969 signature.

970 **'errors-detected'** : If the Printer supports this value, the Printer MUST add this value to “job-state-reasons”  
 971 when the Printer generates the first error message. That is, a single occurrence of this value is  
 972 present in the “job-state-reasons” Job Description attribute if the Printer has generated one or more  
 973 errors. An error indicates loss of information, such as a page not imaged. See also the ‘warnings-  
 974 detected’ value.

975 **'warnings-detected'** : If the Printer supports this value, the Printer MUST add this value to “job-state-  
 976 reasons” when the Printer generates the first warning message. That is, a single occurrence of this  
 977 value is present in the “job-state-reasons” Job Description attribute if the Printer has generated one  
 978 or more warnings. A warning indicates something did not go as expected, but there was no loss of  
 979 information. For example, a font substitution. See also the ‘errors-detected’ value.

980 **6.2 New media (type 3 keyword | name(MAX)) Values**

981 This section specifies one new value for the "media" Job Template attribute:

982 **'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in'**: The client has explicitly allowed a choice of media for  
 983 the Job. The Printer MUST choose physical media of size na\_letter\_8.5x11in (215.9 x 279.4 mm) or  
 984 iso\_a4\_210x297mm. The Printer MUST NOT choose physical media of any other size. The Printer  
 985 MAY scale the image to fit, but any scaling MUST be isomorphic scaling and without image content  
 986 loss, or overflow to additional sheets (so-called tiling), or truncate (and MUST notify the sending user  
 987 and receiving user by implementation means if truncation is performed, since that is loss of  
 988 information).

989 **Rationale:** If printing by reference, the size of the document isn't known by the submitter.

990 See Annex A (section 18) for additional requirements for a revision of the PWG IEEE/ISTO 5101.1 Candidate  
 991 Standard [pwg5101.1] to include the new **'choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in'** and other choice  
 992 values.

993 **7 New Printer Description attributes**

994 This section lists *the new* Printer Description attributes defined in this document. These Printer attributes are “xxx-  
 995 supported” and “xxx-default” Printer attributes which indicate the default and supported values that the Printer  
 996 supports.. The Printer MUST support these Printers attributes if the Printer supports the corresponding “xxx”  
 997 Operation attributes (see section 3) that the client can supply in a Job Creation or Document Creation request.

998 The column labels are:  
 999

Column Heading	
<b>“Attribute Syntax”</b>	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 7. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.
<b>“Reference”</b>	the section which defines the semantics of the attribute.

1000

1001

Table 10 - New Printer Description attributes

Printer <b>Description</b> attribute name	Attribute Syntax	Reference
<b>document-charset-default</b>	charset	[this-spec] §7.1
<b>document-charset-supported</b>	1setOf charset	[this-spec] §7.2
<b>document-digital-signature-default</b>	type2 keyword	[this-spec] §7.3
<b>document-digital-signature-supported</b>	1setOf type2 keyword	[this-spec] §7.4
<b>document-format-details-default</b>	collection	[this-spec] §7.5
<b>document-format-details-supported</b>	1setOf type2 keyword	[this-spec] §7.6
<b>document-format-version-default</b>	text(127)	[this-spec] §7.7
<b>document-format-version-supported</b>	1setOf text(127)	[this-spec] §7.8
<b>document-natural-language-default</b>	naturalLanguage	[this-spec] §7.9
<b>document-natural-language-supported</b>	1setOf naturalLanguage	[this-spec] §7.10

1002

### 1003 **7.1 document-charset-default (charset)**

1004 This OPTIONAL Printer Description attribute indicates the default charset that the Printer will assume for charset-ambiguous document formats when the client omits the “document-charset” Operation attribute (section 3.2.2). The  
1005 Printer MUST support this attribute if it supports the corresponding “document-charset” Operation attribute (see  
1006 section 3.2.2)  
1007

### 1008 **7.2 document-charset-supported (1setOf charset)**

1009 This OPTIONAL Printer Description attribute indicates the charsets that the Printer supports in Document Content,  
1010 that is, supports as values of the “document-charset” Operation attribute (section 3.2.2). The Printer MUST support  
1011 this attribute if it supports the corresponding “document-charset” Operation attribute (see section 3.2.2).

### 1012 **7.3 document-digital-signature-default (type2 keyword)**

1013 This OPTIONAL Printer Description attribute indicates the default digital signature, if any, that the Printer will assume  
1014 when the client omits the “document-digital-signature” Operation attribute (section 3.2.3). The Printer MUST support  
1015 this attribute if it supports the “document-digital-signature” Operation attribute.

### 1016 **7.4 document-digital-signature-supported (1setOf type2 keyword)**

1017 This OPTIONAL Printer Description attribute indicates the digital signature technologies that the Printer supports in  
1018 Document Contents, that is, supports as values of the “document-digital-signature” Operation attribute (section  
1019 3.2.3). The Printer MUST support this attribute if it supports the “document-digital-signature” Operation attribute.

### 1020 **7.5 document-format-details-default (collection)**

1021 This OPTIONAL Printer Description attribute indicates the default document format details that the Printer will  
1022 assume when the client omits the “document-format-details” Operation attribute (section §3.2.5). The member  
1023 attributes are the same as “document-format-details” (see section 3.2.5). The Printer MUST support this attribute, if it  
1024 supports the “document-format-details” Operation attribute (see section 3.2.5).



1025 **7.6 document-format-details-supported (1setOf type2 keyword)**

1026 This OPTIONAL Printer Description attribute lists the type2 keyword names of the member attributes of “document-  
 1027 format-details” that the Printer supports. The Printer MUST support this “document-format-details” (1setOf type2  
 1028 keyword) Printer Description attribute, if the Printer supports the “document-format-details” (1setOf collection)  
 1029 Operation attribute (see section 3.2.5). Table 11 lists the type2 keywords defined for use in the “document-format-  
 1030 details-supported” Printer attribute.

1031 **Table 11 - Keyword values of "document-format-details-supported Printer attribute**

Type2 keyword values	Printer conformance
document-source-application-name	MAY
document-source-application-version	MAY
document-source-os-name	MAY
document-source-os-version	MAY
document-format	MUST
document-format-device-id	MAY
document-format-version	MUST
document-natural-language	MAY

1032

1033 **7.7 document-format-version-default (text(127))**

1034 This OPTIONAL Printer Description attribute indicates the default document format version that the Printer will  
 1035 assume when the client omits the “document-format-version” Operation attribute (section 3.2.6). The Printer MUST  
 1036 support this attribute if it supports the “document-format-version” Operation attribute.

1037 **7.8 document-format-version-supported (1setOf text(127))**

1038 This OPTIONAL Printer Description attribute indicates the document format versions that the Printer supports for  
 1039 Document Contents, that is, supports as values of the “document-format-version” Operation attribute (section 3.2.6).  
 1040 The Printer MUST support this attribute if it supports the “document-format-version” Operation attribute.

1041 **7.9 document-natural-language-default (naturalLanguage)**

1042 This OPTIONAL Printer Description attribute indicates the default document natural language that the Printer will  
 1043 assume for Document Content when the client omits the “document-natural-language” Operation attribute ([rfc2911]  
 1044 section 3.2.1.1). The Printer MUST support this attribute if it supports the “document-natural-language” Operation  
 1045 attribute.

1046 **7.10 document-natural-language-supported (1setOf naturalLanguage)**

1047 This OPTIONAL Printer Description attribute lists the natural languages supported in any of the supported document  
 1048 formats, that is, it is the union of the natural languages. The Printer MUST support this attribute if it supports the  
 1049 “document-natural-language” Operation attribute ([rfc2911] section 3.2.1.1).

1050 **8 Status codes**

1051 This section defines additional status codes.

1052 **8.1 server-error-too-many-jobs (0x050B)**

1053 The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity  
 1054 of the Printer. The client MAY try the unmodified request again at some later point in time with an expectation that  
 1055 the capacity condition may have changed.

1056 **8.2 server-error-too-many-documents (0x050C)**

1057 The client has attempted to create a Document using any of the Document Creation operations which would exceed  
 1058 the capacity of the Printer for this Job. The client MAY try the unmodified request again at some later point in time  
 1059 with an expectation that the capacity condition may have changed.

1060 **9 Override Scope of Attributes**

1061 This section defines the Override Scope of the Job Template attributes. An Override Scope is only applicable when  
 1062 the Job Template attribute is applied as part of an Override [ippOverride]. An Override allows specifying Job  
 1063 Template attributes that apply to a portion of a Job. The portion of the Job that an Override can apply is referred to  
 1064 as its Scope. A Scope is the smallest entity to which a Job Template attribute applies. The order of Scopes is: a Job  
 1065 contains one or more Documents that are printed on one or more Sheets that have up to two Impressions containing  
 1066 one or more Pages. For a Printer to support a Job Template attribute in an Override, it MUST support the Job  
 1067 Template at the specified Scope. Furthermore the scope of the attribute MUST be 'Sheet', 'Impression' or 'Page'.  
 1068 Although operation attributes can not be used in an Override, their scope is of interest to determine their applicability  
 1069 in "Send-Document" and "Send-Uri". The various possible scopes of Operation and Job Template attributes are:

- 1070 **Job** Job Template Attributes that operate on whole Jobs are not applicable as page overrides.
- 1071 **Document** Job Template Attributes that operate on whole Documents are not applicable as page  
 1072 overrides. (The Document operations "Send-Document" and Send-Iri" as well as the  
 1073 Document Object [ippdoc] are used to apply overrides at this level.)
- 1074 **Sheet** Job Template Attributes that operate on whole Sheets, such as "media" and "finishings".  
 1075 Attributes with this scope MAY be included in "overrides".
- 1076 **Impression** Job Template Attributes that operate on whole Impressions, such as "number-up" or "x-  
 1077 side1-image-shift". Attributes with this scope MAY be included in "overrides".
- 1078 **Page** Job Template Attributes that operate on whole Pages, such as "orientation-requested" or  
 1079 "print-quality". Attributes with this scope MAY be included in "overrides".
- 1080

1081 **9.1 Override Scope of Job Template attributes**

1082 By definition only the "output-device" and "print-content-optimize" attributes from this specification can be used in an  
 1083 Override.

1084 **Table 12 Override Scope for Job Template Attributes**

Attribute Name	Override Scope
job-cover-back	Job

Attribute Name	Override Scope
job-cover-front	Job
job-finishings	Job
job-finishings-col	Job
job-mandatory-attributes	Job
output-device	Sheet
print-content-optimize	Page

1085

1086 **9.2 Scope for Operation attributes**

1087 Although, by definition, Operation attributes do not have an Override Scope, their Scope is applicable since the  
 1088 attribute may be supplied as an Operation attribute in the Send-Documents or Send-URI operations. In these cases,  
 1089 the Operation attribute overrides the corresponding value supplied at the Job Level in the Create-Job operation.  
 1090 Table 13 shows the pseudo "Override Scope" of the Operation attributes referenced in this specification. Note that  
 1091 although these attributes may be used with a Document they can not be used as Overrides.

1092

**Table 13 Scope for Operation Attributes**

Attribute Name	Scope
compression-supplied	Document
document-charset	Document
document-digital-signature	Document
document-format-details	Document
document-format-version	Document
document-format-natural-language	Document
document-message	Document
document-name	Document
document-natural-language	Document

1093

1094 **10 Conformance Requirements**

1095 This specification contains a number of independent OPTIONAL attributes. This section summarizes the  
 1096 conformance requirements for Printers and clients.

1097 **10.1 Printer conformance requirements**

1098 In order to claim conformance to this specification,

- 1099 1. A Vendor MUST explicitly identify the attributes and values supported by the Printer implementation in  
 1100 any such claim of conformance. In addition, the Vendor's Printer implementation:
- 1101 2. MUST meet the conformance requirements for Printers specified in [rfc2911].

- 1102 3. MUST support one or more OPTIONAL Operation attribute according to section 3 and the corresponding  
1103 Job Description attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & and  
1104 combine with #3
- 1105 4. MAY support any Job Template attribute according to section 4.
- 1106 5. MAY support any of the "job-state-reasons" values according to section 6.

## 1107 10.2 Client conformance requirements

1108 In order to claim conformance to this specification,

- 1109 1. A Vendor MUST explicitly identify the attributes and values supported by the client implementation in any  
1110 such claim of conformance. In addition, the Vendor's client:
- 1111 2. MUST meet the conformance requirements for clients specified in [rfc2911]
- 1112 3. MUST support at least one Operation attribute according to section 3 and the corresponding Job Description  
1113 attributes in section 4.1.5.4 and corresponding Printer attributes in section 7. & combine with #3
- 1114 4. MAY support any Job Template attribute according to section 4.

## 1115 11 Normative References

- 1116 [dcs2.0]  
1117 Document Color Separation (DCS), version 2.0. Available at:  
1118 <http://www.npes.org/standards/Tools/DCS20Spec.pdf>
- 1119 [dss]  
1120 U.S. Department of Commerce, "Digital Signature Standard (DDS)", Federal Information Processing  
1121 Standards Publication 186-1 (FIPS PUB 186-1), December 15, 1998.
- 1122 [ippOverride]  
1123 Zehler, P., Herriot, R., and K. Ocke, "Internet Printing Protocol (IPP): Page Overrides", May 27, 2003,  
1124 [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_EXC/wd-ippOverride10-20030527.doc](ftp://ftp.pwg.org/pub/pwg/ipp/new_EXC/wd-ippOverride10-20030527.doc), .pdf, .rtf, <work in progress>
- 1125 [iso12639]  
1126 ISO 12639:1998 Graphic technology -- Prepress digital data exchange -- Tag image file format for image  
1127 technology (TIFF/IT), 1998.
- 1128 [iso15930]  
1129 ISO 15930-1:2001 Graphic technology -- Prepress digital data exchange -- Use of PDF -- Part 1: Complete  
1130 exchange using CMYK data (PDF/X-1 and PDF/X-1a), 2001.
- 1131 [pdf]  
1132 "Adobe Portable Document Format", Version 1.4, PDF Reference, Third Edition, Adobe Systems  
1133 Incorporated, <http://www.adobe.com>, December 2001.

- 1134 [pwg5100.4]  
1135 Herriot, R., Ocke, K., "Internet Printing Protocol (IPP): Override Attributes for Documents and Pages", IEEE-  
1136 ISTO 5100.4:2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf>. - being obsoleted  
1137 by (1) a new Page Overrides specification which removes the "document-overrides" Job Template attribute  
1138 and Operation attribute in favor of using the Document Object [ippdoc] and (2) a clarified definition of  
1139 "pages-per-subset" Job Template attribute [ippfutures].
- 1140 [pwg5100.3]  
1141 Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO  
1142 5100.3-2001, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>.
- 1143 [rfc1991]  
1144 D. Atkins, W. Stallings, P. Zimmermann, "PGP Message Exchange Formats", RFC 1991, August, 1996.
- 1145 [rfc2046]  
1146 Freed, N., and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC  
1147 2046, November 1996.
- 1148 [rfc2634]  
1149 P. Hoffman, "Enhanced Security Services for S/MIME", RFC 2634, June 1999.
- 1150 [rfc2854]  
1151 Connolly, D., and L. Masinter, "The 'text/html' Media Type", RFC 2854, June 2000.
- 1152 [rfc2911]  
1153 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.1: Model and  
1154 Semantics", RFC 2911, September 2000.
- 1155 [rfc3380]  
1156 Hastings, T., Herriot, R., Kugler, C., and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set  
1157 Operations", RFC 3380, September 2002.
- 1158 [rfc3382]  
1159 deBry, R., Hastings, T., Herriot, R., Ocke, K., and P. Zehler, "Internet Printing Protocol (IPP): The 'collection'  
1160 attribute syntax", RFC 3382, September 2002.
- 1161 [upnp]  
1162 Microsoft, "Basic *PrintBasic:1.0* Service Template Version 1.01 For Universal Plug and Play Version 1.0"
- 1163 [xmldsig]  
1164 D. Eastlake, J. Reagle, D. Solo "XML-Signature Syntax and Processing", <draft-ietf-xmldsig-core-11.txt>,  
1165 October 31, 2000.
- 1166 **12 Informative References**
- 1167 [fsg-jt]  
1168 Free Software Group, Open Printing Job Ticket API, Visit: <http://www.freestandards.org/openprinting/>

- 1169 [ippact]  
1170 Carney, D., and H. Lewis, "Internet Printing Protocol (IPP), "-actual" attributes extension", work in progress,  
1171 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)
- 1172 [ippdoc]  
1173 Hastings, T., and P. Zehler, "Internet Printing Protocol (IPP): Document Object", October 14, 2002,  
1174 [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_DOC/wd-ippdoc10-20030519.doc](ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc10-20030519.doc), .pdf, .rtf <work in progress>
- 1175 [ippfax]  
1176 Moore, P., Songer, G., Hastings, T., McDonald, Pulera, and M. Joel, "IPP FAX Protocol", July 26, 2001,  
1177 <ftp://ftp.pwg.org/pub/pwg/QUALDOCS/pwg-iff-ippfax-P16-030423.pdf>.
- 1178 [ippfutures]  
1179 Work in progress to contain attributes not needed immediately. No draft is currently available.
- 1180 [pwg-psi]  
1181 "Print Service Interface (PSI)", work in progress to become a PWG IEEE-ISTO standard. Visit  
1182 <http://www.pwg.org/>.
- 1183 [pwg-sm]  
1184 Zehler, P., and S. Albright, "PWG Semantic Model", work in progress to become a PWG IEEE-ISTO standard,  
1185 version 0.11, September 27, 2002. <ftp://ftp.pwg.org/pub/pwg/Semantic-Model/PWG-Semantic-Model.pdf>
- 1186 [rfc2565]  
1187 Herriot, R., Butler, S., Moore, P., and R. Turner, "Internet Printing Protocol/1.0: Encoding and Transport",  
1188 RFC 2565, April 1999.
- 1189 [rfc2566]  
1190 R. deBry, T. Hastings, R. Herriot, S. Isaacson, and P. Powell, "Internet Printing Protocol/1.0: Model and  
1191 Semantics", RFC 2566, April 1999.
- 1192 [rfc2567]  
1193 Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.
- 1194 [rfc2568]  
1195 Zilles, S., "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol", RFC 2568,  
1196 April 1999.
- 1197 [rfc2569]  
1198 Herriot, R., Hastings, T., Jacobs, N., Martin, J., "Mapping between LPD and IPP Protocols", RFC 2569, April  
1199 1999.
- 1200 [rfc3196]  
1201 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1: Implementer's  
1202 Guide", RFC 3196, November 2001.

1203 [rfc3239]  
 1204 Kugler, C., Lewis, H. and T. Hastings, "Internet Printing Protocol (IPP): Requirements for Job, Printer, and  
 1205 Device Administrative Operations", RFC 3239, February 2002.

1206 **13 IANA Considerations**

1207 This section contains the registration information for IANA to add to the various IPP Registries according to the  
 1208 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting  
 1209 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

1210 *Note to the PWG Editor: Replace the References below to [this spec] with the IEEE-ISTO standard number*  
 1211 *for the appropriate document, so that it accurately reflects the content of the information for the IANA Registry.*

1212 **13.1 Attribute Registrations**

1213 The following table lists all the attributes defined in this specification. These are to be registered according to the  
 1214 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this  
 1215 specification, that sub-section is listed as the Reference. This table contains the reference to another specification  
 1216 that completely defines each attribute.

1217	<b>Attribute Name (attribute syntax)</b>	<b>Reference</b>	<b>Section</b>
1218	-----	-----	-----
1221	<b>Job Description attributes:</b>		
1222	compression-supplied (type3 keyword)	[this spec]	5.2.1
1223	document-charset-supplied (charset)	[this spec]	5.2.2
1224	document-digital-signature-supplied (type2 keyword)		
1225		[this spec]	5.2.3
1226	document-format-details-supplied (1setOf collection)		
1227		[this spec]	5.2.4
1228	document-source-application-name (name(MAX))	[this spec]	5.2.4
1229	document-source-application-version (text(127))		
1230		[this spec]	5.2.4
1231	document-source-os-name (name(40))	[this spec]	5.2.4
1232	document-source-os-version (text(40))	[this spec]	5.2.4
1233	document-format (mimeType)	[this spec]	5.2.4
1234	document-format-device-id (text(127))	[this spec]	5.2.4
1235	document-format-version (text(127))	[this spec]	5.2.4
1236	document-natural-language (1setOf naturalLanguage)		
1237		[this spec]	5.2.4
1238	document-format-supplied (mimeType)	[this spec]	5.2.5
1239	document-format-version-supplied (text(127))	[this spec]	5.2.6
1240	document-message-supplied (text(MAX))	[this spec]	5.2.7
1241	document-name-supplied (name(MAX))	[this spec]	5.2.8
1242	document-natural-language-supplied (naturalLanguage)		
1243		[this spec]	5.2.9
1244	errors-count (integer(0:MAX))	[this spec]	5.1.1

1245	job-attribute-fidelity (boolean)	[this spec]	5.1.2
1246	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	5.1.3
1247	warnings-count (integer(0:MAX))	[this spec]	5.1.4
1248			
1249	<b>Job Template attributes:</b>		
1250	job-copies (integer(1:MAX))	[this spec]	4.1.1
1251	job-copies-default (integer(1:MAX))	[this spec]	4.1.1.1
1252	job-copies-supported (rangeOfInteger(1:MAX))	[this spec]	4.1.1.2
1253	job-copies-actual (1setOf Integer(1:MAX))	[this spec]	4.1.1.3
1254	job-cover-back (collection)	[this spec]	4.1.2
1255	<member attributes are the same as "cover-back"	[pwg5100.3]	3.1>
1256	job-cover-back-default (collection)	[this spec]	4.1.2.1
1257	<member attributes are the same as "cover-back"	[pwg5100.3]	3.1>
1258	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1259	job-cover-back-actual (1setOf collection)	[this spec]	4.1.2.3
1260	<member attributes are the same as "cover-back"	[pwg5100.3]	3.1>
1261	job-cover-front (collection)	[this spec]	
1262	4.1.34.1.2.3		
1263	<member attributes are the same as "cover-front"	[pwg5100.3]	3.1>
1264	job-cover-front-default (collection)	[this spec]	4.1.3.1
1265	<member attributes are the same as "cover-front"	[pwg5100.3]	3.1>
1266	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.3.2
1267	job-cover-front (1setOf collection)	[this spec]	4.1.3.3
1268	<member attributes are the same as "cover-front"	[pwg5100.3]	3.1>
1269	job-finishings (1setOf type2 enum)	[this spec]	4.1.4
1270	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1271	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1272	job-finishings-supported (1setOf type2 keyword)	[this spec]	4.1.4.3
1273	job-finishings-actual (1setOf type2 enum)	[this spec]	4.1.4.4
1274	job-finishings-col (1setOf collection)	[this spec]	4.1.5
1275	<member attributes are the same as "finishings-col"	[pwg5100.3]	3.2>
1276	job-finishings-col-default (1setOf type2 enum)	[this spec]	4.1.5.1
1277	job-finishings-col-ready (1setOf type2 enum)	[this spec]	4.1.5.2
1278	job-finishings-col-supported (1setOf type2 keyword)		
1279		[this spec]	4.1.5.3
1280	job-finishings-col-actual (1setOf collection)	[this spec]	4.1.5.4
1281	<member attributes are the same as "finishings-col"	[pwg5100.3]	3.2>
1282	output-device (name(127))	[this spec]	4.2.1
1283	output-device-ready (1setOf name(127))	[this spec]	<b>Error!</b>
1284	<b>Reference source not found.</b>		
1285	output-device-supported (1setOf name(127))	[this spec]	4.2.1.2
1286	output-device-actual (1setOf name(127))	[this spec]	4.2.1.3
1287	print-content-optimize (type2 keyword)	[this spec]	4.2.2
1288	print-content-optimize-default (type2 keyword)	[this spec]	4.2.2.1
1289	print-content-optimize-supported (1setOf type2 keyword)		
1290		[this spec]	4.2.2.2



1291	print-content-optimize-actual (1setOf type2 keyword)		
1292		[this spec]	4.2.2.3
1293			
1294	<b>Printer Description attributes:</b>		
1295	document-charset-default (charset)	[this spec]	7.1
1296	document-charset-supported (1setOf charset)	[this spec]	7.2
1297	document-digital-signature-default (type2 keyword)	[this spec]	7.3
1298	document-digital-signature-supported (1setOf type2 keyword)		
1299		[this spec]	7.4
1300	document-format-details-default (collection)	[this spec]	7.5
1301	<member attributes are the same as "document-format-details"		
1302		[this spec]	3.2.5>
1303	document-format-details-supported (1setOf type2 keyword)		
1304		[this spec]	7.6
1305	document-format-version-default (text(127))	[this spec]	7.7
1306	document-format-version-supported (1setOf text(127))	[this spec]	7.8
1307	document-natural-language-default (naturalLanguage)	[this spec]	7.9
1308	document-natural-language-supported (1setOf naturalLanguage)		
1309		[this spec]	7.10
1310			
1311	<b>Operation attributes:</b>		
1312	document-charset (charset)	[this spec]	3.2.2
1313	document-digital-signature (type2 keyword)	[this spec]	3.2.3
1314	document-format-details (1setOf collection)	[this spec]	3.2.5
1315	document-source-application-name (name(MAX))	[this spec]	3.2.5.1
1316	document-source-application-version (text(127))		
1317		[this spec]	3.2.5.2
1318	document-source-os-name (name(40))	[this spec]	3.2.5.3
1319	document-source-os-version (text(40))	[this spec]	3.2.5.4
1320	document-format (mimeMediaType)	[this spec]	3.2.5.5
1321	document-format-device-id (text(127))	[this spec]	3.2.5.6
1322	document-format-version (text(127))	[this spec]	3.2.5.7
1323	document-natural-language (1setOf naturalLanguage)		
1324		[this spec]	3.2.5.8
1325	document-format-version (text(127))	[this spec]	3.2.6
1326	document-natural-language (naturalLanguage)	[this spec]	3.2.9
1327	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1328	<b>13.2 Keyword attribute values</b>		
1329	document-digital-signature (type2 keyword)	[this spec]	3.2.3
1330	document-digital-signature-default (type2 keyword)		
1331		[this spec]	7.3
1332	document-digital-signature-supported (1setOf type2 keyword)		
1333		[this spec]	7.4
1334	dss	[this spec]	3.2.3
1335	none	[this spec]	3.2.3

1336	pgp	[this spec]	3.2.3
1337	smime	[this spec]	3.2.3
1338	xmldsig	[this spec]	3.2.3
1339			
1340	document-format-details-supported (1setOf type2 keyword)		
1341		[this spec]	7.6
1342	document-source-application-name	[this spec]	7.6
1343	document-source-application-version	[this spec]	7.6
1344	document-source-os-name	[this spec]	7.6
1345	document-source-os-version	[this spec]	7.6
1346	document-format	[this spec]	7.6
1347	document-format-device-id	[this spec]	7.6
1348	document-format-version	[this spec]	7.6
1349	document-natural-language	[this spec]	7.6
1350			
1351	job-cover-back-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1352	<same as "cover-back-supported">	[pwg5100.3]	3.1.4
1353	job-cover-front-supported (1setOf type2 keyword)	[this spec]	4.1.2.2
1354	<same as "cover-front-supported">	[pwg5100.3]	3.1.4
1355	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	3.1.2
1356	<any Job Template attribute keyword>		
1357			
1358	job-state-reasons (1setOf type2 keyword)	[rfc2911]	4.3.8
1359	digital-signature-did-not-verify	[this spec]	6.1
1360	digital-signature-type-not-supported	[this spec]	6.1
1361	errors-detected	[this spec]	6.1
1362	job-digital-signature-wait	[this spec]	6.1
1363	warnings-detected	[this spec]	6.1
1364			
1365	media (type2 keyword   name(MAX))	[rfc2911]	4.2.11
1366	choice_iso_a4_210x297mm_na_letter_8.5x11in	[this spec]	6.2
1367	print-content-optimize (type2 keyword)	[this spec]	4.2.2
1368	photo	[this spec]	4.2.2
1369	graphic	[this spec]	4.2.2
1370	text	[this spec]	4.2.2
1371	text-and-graphic	[this spec]	4.2.2
1372			

### 1373 13.3 Enum Attribute Values

1374 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.  
 1375 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

1376			
1377	job-finishings (1setOf type2 enum)	[this spec]	4.1.3.3
1378	job-finishings-default (1setOf type2 enum)	[this spec]	4.1.4.1
1379	job-finishings-ready (1setOf type2 enum)	[this spec]	4.1.4.2
1380	job-finishings-supported (1setOf type2 enum)	[this spec]	4.1.4.3

1381 <enum values are the same as "finishings">  
1382  
1383 job-finishings-col-supported (1setOf type2 keyword)  
1384 [this spec] 4.1.5.3  
1385 <same as for "finishing-col-supported" [pwg5100.3] 3.2.5

## 1386 14 Internationalization Considerations

1387 The internationalization considerations for the extensions defined in this specification are the same as for handling  
1388 the Job object in [rfc2911].

## 1389 15 Security Considerations

1390 This specification adds no more security burden on Printer implementations than does [rfc2911].

## 1391 16 Contributors

1392 Don Fullman, Xerox  
1393 Ira McDonald, High North  
1394 Dennis Carney, IBM

## 1395 17 Author's Address

1396 Tom Hastings  
1397 Xerox Corporation  
1398 737 Hawaii St.  
1399 El Segundo, CA 90245  
1400  
1401 Phone: 310 333-6413  
1402 Fax: 310 333-5514  
1403 e-mail: [hastings@cp10.es.xerox.com](mailto:hastings@cp10.es.xerox.com)  
1404

1405 Peter Zehler  
1406 Xerox Corporation  
1407 MS: 0128-30E  
1408 800 Phillips Road  
1409 Webster, NY 14580-9701  
1410  
1411 Phone: 1+585+2658755  
1412 Fax:  
1413 e-mail: [PZehler@crt.xerox.com](mailto:PZehler@crt.xerox.com)  
1414

1415 **18 Annex A: Additional requirements for a revision of the PWG IEEE/ISTO**  
1416 **5101.1 Candidate Standard [pwg5101.1] to add the new 'choice\_xxx'**

1417 This section also generalizes the choice mechanism for inclusion in a revision to the PWG IEEE/ISTO 5101.1  
1418 Candidate Standard [pwg5101.1]. This specification gives the *outline* of the proposed addition to [pwg5101.1] for  
1419 information only, in order to agree to the one new value defined for use with IPPFAX, namely,  
1420 '**choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in**'.

1421 The proposed extension to [pwg5101.1] will have the following requirements:

- 1422 1. The ABNF will be extended to define the '**choice\_**' prefix to introduce a list of choices of self describing  
1423 names.
- 1424 2. Following the '**choice\_**' prefix will be two or more fully self describing names, including all three fields.
- 1425 3. The order of the list of fully self describing names **MUST** be in alphabetic order, so that there is only one  
1426 canonical order for each list of choices.
- 1427 4. Printer **MAY** support dynamic combinations of supported values or **MAY** support the entire choice value as a  
1428 conventional keyword which it simply matches for validation purposes.
- 1429 5. Printer **MUST** map the choice value to a particular supported value when selecting the actual media for  
1430 marking.
- 1431 6. If the Printer supports a '**choice\_xxx**' "media" attribute value and the "media-ready" Printer attribute, the  
1432 Printer **MUST** include the '**choice\_xxx**' value in its "media-ready" Printer attribute as well as the currently  
1433 loaded value(s) when at least one of the members of a choice value is ready. For example, if  
1434 '**iso\_a4\_210x297mm**' is loaded, then the "media-ready" Printer attribute **MUST** include the  
1435 '**iso\_a4\_210x297mm**' and the '**choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in**' values.

1436 **19 Annex B: Change Log (informative - to be removed before publication)**

1437 The following summaries of the changes in chronological order:

1438 Version 0.7, September 11, 2003:

- 1439 1. Prepared specification for Last Call
- 1440 2. Changed Maturity to Stable
- 1441 3. Removed highlights & empty table rows
- 1442 4. Removed unused references and changed some references to informative

1443  
1444