



Project of the PWG-IPP Working Group

# Internet Printing Protocol (IPP): Override Attributes for Documents and Pages

Draft D0.9  
December 15, 2000

[ftp://ftp.pwg.org/pub/pwg/ipp/new\\_EXC/pwg-ipp-override-attributes-001215.doc](ftp://ftp.pwg.org/pub/pwg/ipp/new_EXC/pwg-ipp-override-attributes-001215.doc), .rtf, .pdf

## Abstract

This document specifies an extension to the Internet Printing Protocol/1.0 (IPP) [RFC2565, RFC2566] and IPP/1.1 [ipp-mod, ipp-pro]. This extension relaxes the restriction that each attribute value is the same for all pages, all documents and all document copies within a job. For example, with this extension, page 1 of a job could have a different media from the other pages in the job or document 2 of a job could be stapled while the other documents of the job are not. As another example, the first ten copies of a document could be printed on letter paper and stapled while the eleventh copy of the same document could be printed on transparencies with no staple.

This extension supports document overrides and page overrides by adding two new Job Template attributes: “document-overrides” and “page-overrides” -- both have a syntax type of “1setOf collection”. Each ‘collection’ value for “document-overrides” contains an attribute that identifies the overridden documents, namely “input-documents” or “output-documents”. The ‘collection’ value also contains one or more attributes that are overrides for the identified documents, e.g. “document-format”, “finishings”, and “media”. Each ‘collection’ value for “page-overrides” contains two attributes that identify the overridden pages, namely “input-documents” or “output-documents” plus “pages”. The ‘collection’ value also contains one or more attributes that are overrides for the identified pages, e.g. “sides” and “media”. When the overrides apply to some but not all document copies, the ‘collection’ value for “document-overrides” or “page-overrides” contains the attribute of “document-copies”.

This extension also supports subset finishing by adding a new Job Template attribute “pages-per-subset”, which specifies the number of pages per subset. The extension allows finishing and other document attributes to be applied to such subsets of pages.

This document is a PWG-Draft of an IEEE-ISTO PWG Proposed Standard and is in full conformance with all provisions of the PWG Process (see <http://www.pwg.org/chair/pwg-process-990825.pdf>). PWG-Drafts are working documents of the IEEE-ISTO PWG and its working groups. The list of current PWG-Drafts can be accessed at <http://www.pwg.org/pub/pwg/>

Copyright (C) 2000, IEEE Industry Standards and Technology Organization. All rights reserved.

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

Title: Internet Printing Protocol (IPP): Override Attributes for Documents and Pages

41

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

45

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

48

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

52

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

58

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

60

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

64

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

67

67

## Table of Contents

68	1.	Introduction .....	6
69	2.	Terminology .....	6
70	2.1	REQUIRED .....	6
71	2.2	OPTIONAL .....	6
72	2.3	Override-Extension .....	7
73	2.4	Sheet .....	7
74	2.5	Output-Page .....	7
75	2.6	Finished-Page Image .....	7
76	2.7	Impression .....	7
77	2.8	Input-Page .....	7
78	2.9	Input-Document .....	7
79	2.10	Output-Document .....	8
80	2.11	Output-Document-Copy .....	8
81	2.12	Relationship between Input-Document and Output-Documents .....	8
82	2.12.1	Degenerate Case .....	9
83	2.12.2	Separate Documents Case .....	9
84	2.12.3	Single Document Case .....	9
85	2.12.4	Page-Subset Document Case .....	9
86	2.12.5	Document-Subset Document Case .....	10
87	2.13	Document-Overrides .....	10
88	2.14	Page-Overrides .....	10
89	2.15	Subset-Finishing .....	10
90	2.16	Affects .....	10
91	2.17	Associates .....	11
92	2.17.1	Directly Associates .....	11
93	2.17.2	Effectively Associates .....	11
94	2.18	Job-Submission Operations .....	11
95	3.	Requirements .....	11
96	4.	Overview .....	11
97	4.1	Numbering of Components .....	12
98	4.2	Relationship of Numbered Components .....	12
99	4.2.1	Degenerate Case: .....	13
100	4.2.2	Separate-Documents Case: .....	13
101	4.2.3	Single-Document Case: .....	14
102	4.2.4	Page-Subset Document Case: .....	15
103	4.2.5	Document-Subset Document Case: .....	16
104	4.3	Association of Attributes .....	16
105	4.4	Effect of the “document-copies” attribute .....	17
106	4.5	Subset Finishing .....	17
107	5.	New Job Template Attributes .....	18
108	5.1	document-overrides (1setOf collection) .....	19
109	5.1.1	input-documents (1setOf rangeOfInteger (1:MAX)) .....	20
110	5.1.2	output-documents (1setOf rangeOfInteger (1:MAX)) .....	21

111	5.1.3	document-copies (1setOf rangeOfInteger (1:MAX)).....	21
112	5.1.4	document-format (mimeMediaType).....	21
113	5.1.5	document-name (name (MAX)).....	22
114	5.1.6	compression (type3 keyword).....	22
115	5.1.7	document-natural-language (naturalLanguage).....	22
116	5.1.8	page-ranges (1setOf rangeOfInteger (1:MAX)).....	22
117	5.1.9	finishings (1setOf type2 enum).....	22
118	5.1.10	sides (type2 keyword).....	23
119	5.1.11	media (type3 keyword   name(MAX)).....	23
120	5.1.12	Handling of Error conditions.....	23
121	5.1.13	Why not “document-overrides-default”.....	24
122	5.1.14	document-overrides-supported (1setOf type2 keyword).....	24
123	5.2	page-overrides (1setOf collection).....	25
124	5.2.1	input-documents (1setOf rangeOfInteger (1:MAX)).....	26
125	5.2.2	output-documents (1setOf rangeOfInteger (1:MAX)).....	26
126	5.2.3	document-copies (1setOf rangeOfInteger (1:MAX)).....	27
127	5.2.4	pages (1setOf rangeOfInteger(1:MAX)).....	27
128	5.2.5	sides (type2 keyword).....	28
129	5.2.6	media (type3 keyword   name(MAX)).....	28
130	5.2.7	Handling of Error conditions.....	28
131	5.2.8	Why not “page-overrides-default”.....	28
132	5.2.9	page-overrides-supported (1setOf type2 keyword).....	28
133	5.3	pages-per-subset (1setOf integer).....	29
134	5.3.1	Why not “pages-per-subset-default”.....	29
135	5.3.2	pages-per-subset-supported (boolean).....	30
136	6.	New Job Description attributes.....	30
137	6.1	job-warnings-count (integer).....	30
138	7.	New Job Description Values.....	30
139	7.1	job-warnings-detected value for job-state-reasons (1setOf type2 keyword).....	30
140	8.	Extended Role of Some Operation Attributes.....	30
141	9.	Extensions to Printer Operations.....	31
142	9.1	Create-Job and Validate-Job Operation Requests.....	31
143	9.2	Send-Document and Send-URI Operation Requests.....	32
144	10.	Examples.....	32
145	10.1	First Page of Single Document is Letterhead.....	32
146	10.1.1	Degenerate Case.....	33
147	10.2	First Page of Several Documents is Blue.....	33
148	10.2.1	Separate-Documents Case.....	33
149	10.2.2	Single-Documents Case.....	34
150	10.2.3	Page-Subset Documents Case.....	34
151	10.3	First Page is Blue and First Document is not stapled.....	35
152	10.3.1	Separate-Documents Case.....	35
153	10.3.2	Single-Documents Case.....	37
154	10.3.3	Page-Subset Documents Case.....	39
155	10.4	One document with 100 copies for distribution and one on transparencies.....	40

156 10.4.1 First solution .....40  
 157 10.4.2 Second solution.....41  
 158 10.4.3 Third solution.....41

159 11. IANA Considerations .....42  
 160 11.1 Attribute Registration .....42  
 161 11.2 Attribute Value Registration.....42

162 12. Internationalization Considerations .....43

163 13. Security Considerations .....43

164 14. References .....43

165 15. Author's Addresses .....43

166 16. Appendix A: Rules for Attribute Association .....44

167 17. Appendix B: Summary of other IPP documents .....44

168 18. Appendix C: Description of the IEEE Industry Standards and Technology (ISTO).....45

169 19. Appendix D: Description of the IEEE-ISTO PWG .....45  
 170  
 171

## 171 **1. Introduction**

172 The Internet Printing Protocol (IPP) is an application level protocol for distributed printing using Internet tools and technologies.  
173 IPP version 1.1 (IPP/1.1) requires that each attribute value be the same for all pages, all documents and all document copies  
174 within a job. This document defines OPTIONAL extensions to the IPP/1.1 model which relax this restriction and allow pages,  
175 documents and document copies to have attributes that are overrides. For example, with this extension, page 1 of a job could have  
176 a different media or different value of “sides” from the other pages in the job, or document 2 of a job could be stapled while the  
177 other documents of the job are not. As another example, the first ten copies of a document could be printed on letter paper and  
178 stapled while the eleventh copy of the same document could be printed on transparencies with no staple. This document is a  
179 proposal for an extension to IPP/1.0 and IPP/1.1.  
180

181 This extension supports document overrides and page overrides by adding two new Job Template attributes: “document-  
182 overrides” and “page-overrides” -- both have a syntax type of “1setOf collection”. Each ‘collection’ value for “document-  
183 overrides” contains

- 184 a) an attribute that identifies the overridden documents, namely “input-documents” or “output-documents”.
- 185 b) an OPTIONAL attribute that identifies the document copies of the specified overridden documents, i.e. “document-  
186 copies”. If this attribute is absent, the overrides apply to all document copies.
- 187 c) one or more attributes that are overrides for the identified documents, e.g. “document-format”, “finishings”, and  
188 “media”.

189 Each ‘collection’ value for “page-overrides” contains

- 190 a) an attribute that identifies the documents containing the overridden pages, namely “input-documents” or “output-  
191 documents”.
- 192 b) an attribute that identifies the overridden pages, namely “pages”.
- 193 c) an OPTIONAL attribute that identifies the document copies of the specified documents, i.e. “document-copies”. If  
194 this attribute is absent, the overrides apply to all document copies.
- 195 d) The ‘collection’ value also contains one or more attributes that are overrides for the identified pages, e.g. “sides”  
196 and “media”.

197  
198  
199 This extension also supports subset finishing with a new Job Template attribute “pages-per-subset”, which specifies the number  
200 of pages per subset. The extension allows finishing and other document attributes to be applied to such subsets of pages.

## 201 **2. Terminology**

202 This section defines the following additional terms that are used throughout this document:

### 203 **2.1 REQUIRED**

204 If an implementation supports the extensions described in this document, it MUST support a REQUIRED feature.

### 205 **2.2 OPTIONAL**

206 If an implementation supports the extensions described in this document, it MAY support an OPTIONAL feature.

## 207 **2.3 Override-Extension**

208 The Override-Extension is the extension proposed in this document that adds attribute overrides for documents and pages. This  
209 extension supports Document-Overrides, Page-Overrides and Subset-Finishing, which are all defined later in this section.

## 210 **2.4 Sheet**

211 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 printer may mark on  
212 one side or on both sides of a sheet.

## 213 **2.5 Output-Page**

214 An Output-Page is the set of all markings that the author intended to be placed on one side of a Sheet, including, but not limited  
215 to, text, drawings, images, footers and headers.

## 216 **2.6 Finished-Page Image**

217 The single image on a Finished Page. A Finished Page is one side of a sheet in a finished document, i.e., one side of a sheet as  
218 perceived by a person *after* any cutting, folding, and/or booklet making (see [pwg-prod-print]). The lay term for Finished Page is  
219 'page'.  
220

221 A Finished-Page Image contains on the images of one or more Output-Pages. Generally a Job submitter prints each Output-Page  
222 as the author intended, namely one Output-Page per Finished-Page Image. Sometimes, a Job submitter prints several Output-  
223 Pages per Finished-Page Image, perhaps to save paper or money. The IPP attribute "number-up" specifies the number of Output-  
224 Pages per Finished-Page Image. When "number-up" is greater than 1, a Finished-Page Image contains multiple Output-Pages.  
225

## 226 **2.7 Impression**

227 An impression is the set of all markings that the Job submitter intended to be placed on one side of a Sheet. Each impression  
228 contains one or more Finished-Page Images. Each impression contains a single Finished-Page Image unless an imposition  
229 operation is applied to the Finished-Page Images.

## 230 **2.8 Input-Page**

231 An Input-Page is a sequence of bytes that describe how to mark a single Output-Page. IPP 1.1 [ipp-mod] uses the term "print-  
232 stream-pages" to refer to both Input-Pages and Output-Pages. There is a one to one relationship between Input-Pages and Output-  
233 Pages and they are in the same order. Both Input-Pages and Output-Pages are numbered sequentially (see section 4.1) starting  
234 from 1 at the beginning of each Input-Document or Output-Document, respectively. When the first Input-Page of an Input-  
235 Document coincides with the first Output-Page of an Output-Document, the numbering of Input-Pages and Output-Pages  
236 coincides; otherwise it doesn't.

## 237 **2.9 Input-Document**

238 An Input-Document is the entire sequence of bytes transmitted as the Document Content in the Print-Job and Send-Document  
239 operations or referenced by the "document-uri" operation attribute in the Print-URI and Send-URI operations. This sequence of  
240 bytes consists of one or more Input-Pages.

241 **2.10 Output-Document**

242 An Output-Document is a set of one or more Sheets which either are permanently bound into a single unit, e.g. with a staple, or  
 243 are intended to be treated by an end-user as a single unit, e.g. for a loose leaf binder. If an Output-Document is bound, it is  
 244 uniformly bound; if it is not bound, no subset of sheets within it are bound. The Output-Pages that comprise an Output-Document  
 245 may come from

- 246
- 247 a) all the Input-Pages of an Input-Document or
- 248 b) a proper subset of the Input-Pages of the Input-Document or
- 249 c) all the Input-Pages of several Input-Documents.

250 An Output-Document is *not* a set of sheets that are bound temporarily for shipping, e.g. with banding.  
 251

252 **2.11 Output-Document-Copy**

253 When a Printer produces more than one or more copies of an Output-Document, each copy is called an Output-Document-Copy.  
 254 Sometimes this specification uses the phrase “copy of Output-Document” to emphasize “copy”, but the phrase is equivalent to  
 255 “Output-Document-Copy”.

256 **2.12 Relationship between Input-Document and Output-Documents**

257 Each relationship is named and defined below. The cases are derived from an analysis of possible tree structures (see section 4.2).  
 258 A client selects the desired case with the number of submitted Input-Documents and the specific values of three attributes: the  
 259 existing Job Template “multiple-document-handling” and two new attributes “pages-per-subset” and “documents-per-subset”.  
 260 The latter two attributes describe how the stream of Input-Pages or Input-Documents and are partitioned into Output-Documents,  
 261 respectively.

262 In this section, the number of copies produced for each Output-Document does not affect the discussion, so it is easiest to assume  
 263 that the number is 1.  
 264

265 The table below summarizes the relationship of Input-Documents to Output-Document in the five cases:  
 266  
 267

Case	Number of	
	Input-Documents	Output-Documents
Degenerate	1	1
Separate-Documents	n	n
Single-Document	n	1
Page-Subset Documents	n	m (m > n)
Document-Subset Documents	n	m (m < n)

268 When n = 1 for the “Separate-Documents” and “Single-Document” become the “Degenerate” case.  
 269

270 The table below summarizes the attribute values that control the cases.  
 271

- 272
- 273 - The “separate” value means that “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-
- 274 documents-uncollated-copies'.
- 275 - The “single” value means that “multiple-document-handling” is 'single-document' or 'single-document-new-sheet'.
- 276 - The “ignored” value means that the attribute need not be present and is ignored if it is present,



- 277 - The “present” value means that the attribute must be present. A different case is implied if it is not present.
- 278 - The “not present” value means that the attribute must not be present. A different case is implied if it is present.
- 279

Case	“multiple-document-handling”	“pages-per-subset”	“documents-per-subset”
Separate-Documents	separate	not present	not present
Single-Documents	single	ignored	ignored
Page-Subset Documents	separate	present	not present
Document-Subset Documents	separate	not present	present

280  
 281 The Degenerate row is omitted because it follows the rules for the “Separate-Documents” and “Single-Documents” rules when  
 282 the number of Input-Documents is 1.  
 283

284 There is an error if both “pages-per-subset” and “document-per-subset” are present in the “separate” case.

### 285 **2.12.1 Degenerate Case**

286 In the Degenerate Case, the Job consists of exactly one Output-Documents and exactly one Input-Documents. The single  
 287 Input-Documents produces the single Output-Documents. This case represents the most common case of printing. For  
 288 example, if a user is Printing a single MS Word file, the MS Word file is the Input-Documents and the printed pages are  
 289 the Output-Documents. This case is the degenerate case of Separate-Documents and Single-Documents. It occurs when the  
 290 number of Input-Documents is 1 and either

- 291
- 292 a) “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies'  
 293 and neither “pages-per-subset” nor “documents-per-subset” are present or.
- 294 b) “multiple-document-handling” is 'single-document' or 'single-document-new-sheet', and both “pages-per-subset” and  
 295 “documents-per-subset” are ignored if present

### 296 **2.12.2 Separate Documents Case**

297 In the Separate Documents Case, the Job consists of one or more Output-Documents where each Input-Documents  
 298 produces one Output-Documents. For example, if a user prints 10 Java files in one Job and wants 10 separately stapled  
 299 Output-Documents, each of the 10 Java files is an Input-Documents, and the printed Output-Pages from each of the 10  
 300 Java files is a separate Output-Documents that is stapled separately. This case occurs when “multiple-document-  
 301 handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies' and the new attributes  
 302 “pages-per-subset” and “documents-per-subset” are not present.

### 303 **2.12.3 Single Document Case**

304 In the Single Document Case, the job consists of a single Output-Documents produced from one or more Input-  
 305 Documents. For example, if a user prints 10 Java files in one Job and wants all Output-Pages of the 10 Java files to be  
 306 produced as 1 stapled Output-Documents, then each of the 10 Java files is an Input-Documents, and all printed Output-  
 307 Pages from all of the 10 Java files is a single Output-Documents that is stapled. This case occurs when “multiple-  
 308 document-handling” is 'single-document' or 'single-document-new-sheet'; the value of “pages-per-subset” and  
 309 “documents-per-subset” are both ignored if present.

### 310 **2.12.4 Page-Subset Document Case**

311 In the Page-Subset Case, the Job consists of one or more Output-Documents and one or more Input-Documents. The  
 312 new attribute “pages-per-subset” contains a sequence of integers which specifies how to partition the stream of Input-

313 Pages into subsets, each of which produces an Output Document. For example, if a user prints 1 PostScript file with  
314 1000 pages, where each 4 Output-Pages represents an insurance policy, then the PostScript file is the Input-Document  
315 and each group of 4 Output-Pages is an Output-Document. The resulting Output-Documents would be the same if the  
316 same 1000 Input-Pages were spread across 2 or more PostScript files. This case occurs when “multiple-document-  
317 handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies' and the new attribute  
318 “pages-per-subset” contains 1 or more integer values. The new attribute “documents-per-subset” is not present.

### 319 **2.12.5 Document-Subset Document Case**

320 This case is defined here for completeness, but it is not supported by this extension.

321  
322 In the Document-Subset Document Case, the Job consists of one or more Output-Documents and one or more Input-  
323 Documents. The new attribute “documents-per-subset” contains a sequence of integers which specifies how to partition  
324 Job’s Input-Documents into subsets, each of which produces an Output Document. For example, if a user prints 25 Java  
325 files in one Job and wants 2 separately stapled Output-Documents, one with 15 Java files and one with 10 Java files,  
326 then each of the Java files is an Input-Document, and the printed Output-Pages from the first 15 Java files and next 10  
327 Java files are two separate Output-Documents that are stapled separately. This case occurs when “multiple-document-  
328 handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies' and “documents-per-subset”  
329 contains 1 or more integer values. The new attribute “pages-per-subset” is not present.  
330

## 331 **2.13 Document-Overrides**

332 In IPP/1.1 each attribute value is the same for the entire Job. When an attribute is a “Document-Overrides” attributes, it is  
333 different for identified Input-Documents or Output-Documents.

## 334 **2.14 Page-Overrides**

335 In IPP/1.1 each attribute value is the same for the entire Job. When an attribute is a “Page-Overrides” attributes, it is different for  
336 identified Input-Pages or Output-Pages.

## 337 **2.15 Subset-Finishing**

338 Subset-Finishing is the ability to subdivide the stream of Input-Pages from one or more Input-Documents into multiple Output-  
339 Documents and to apply the same or different finishing to each individual Output-Document.

## 340 **2.16 Affects**

341 Each attribute is said to ‘affect’ some part of a job. For example, “media” affects a sheet, “finishings” affects an Output-  
342 Document, “page-ranges” affects an Input-Document and “job-priority” affects a job. This nuance must be explicit in the  
343 Overrides-Extension because the parts of a job that an attribute affects limit the parts of a job that an attribute can be associated  
344 with (see the next section for a definition of “associates”). For example, “job-priority” affects a job; so it can be associated with a  
345 Job, but not an Input-Document or Input-Page. Likewise, “finishings” affects an Output-Document; so it can be associated with a  
346 Job or an Output-Document, but not with an Output-Page.

## 347 **2.17 Associates**

348 The word “associates” combines the meaning of the two terms in subsections of this section, namely “directly associates” and  
349 “effectively associates”. When an attribute is either directly associated or effectively associated with some part of a job, it is said  
350 to be “associated” with that part of a job.

### 351 **2.17.1 Directly Associates**

352 When an attribute is said to be ‘directly associated’ with some part of a job, it affects that part or some other part. The  
353 part that it affects depends on the attribute and what the attribute is directly associated with. For example if “media” is  
354 directly associated with a job, it affects all sheets in the job. If “media” is directly associated with an Output-Document,  
355 it affects all sheets in that Output-Document. If “media” is directly associated with an Output-Page, it affects the sheet  
356 containing that Output-Page.

### 357 **2.17.2 Effectively Associates**

358 When an attribute is said to be directly associated with some part of a job ‘A’ that is semantically connected with  
359 another part ‘B’, the attribute is said to be “effectively associated” with ‘B’. For example, in the Separate-Documents  
360 Case, when an attribute is directly associated with an Input-Document, it is effectively associated with the corresponding  
361 Output-Document.

## 362 **2.18 Job-Submission Operations**

363 The Job-Submission Operations are the IPP operations that create jobs and send document content, namely Print-Job, Print-URI,  
364 Create-Job, Send-Documents and Send-URI.

## 365 **3. Requirements**

366 The following is a list of requirements for the Overrides-Extension.

- 367 1. The Override-Extension MUST contain a mechanism for specifying Job attributes that are overrides for particular Input-  
368 Documents or Output-Documents. A Printer and a client OPTIONALLY support this mechanism.
- 369 2. There MUST be a mechanism for specifying Job attributes that are overrides for particular Input-Pages or Output-Pages.  
370 A Printer and a client OPTIONALLY support this mechanism.
- 371 3. There MUST be a mechanism for specifying Job attributes that are overrides for particular document copies of Output-  
372 Documents. A Printer and a client OPTIONALLY support this mechanism.
- 373 4. The mechanism for overrides MUST be supported by all Job-Submission operations and Validate-Job.
- 374 5. The extension MUST support the four relationships of Input-Documents and Output-Documents: Degenerate Case,  
375 Separate-Documents Case, Single-Documents Case and Page-Subset Document Case.
- 376 6. The extension MUST support Subset-Finishing.
- 377

## 378 **4. Overview**

379 In IPP 1.1 all attributes that a client includes with job creation operations affect the entire Job in a uniform way. That is, there is  
380 no way for one Output-Documents in a given Job to be stapled and another drilled. Also, there is no way for the first sheet of each  
381 Output-Documents to be on a different media or to have a different value of “sides” from the other Sheets in the Output-

382 Document. In addition, there is no way for one document copy to be printed on paper and another on transparencies. An IPP/1.1  
383 client can specify features, such as finishing, media and sides only at the job level.

384

385 The Override Extension defined in this document allows some Output-Pages, some Output-Documents and some Input-  
386 Documents to be affected by attribute values that are overrides to those specified for the Job as a whole. For example, the first  
387 Output-Page of an Output-Document has a different media from the rest, or the second Output-Document is stapled and the rest  
388 are not, or the page-ranges of the first Input-Document selects a few Input-Pages and the rest of the Input-Documents are printed  
389 in full, or one copy of an Output-Document has a different media from the rest.

## 390 4.1 Numbering of Components

391 The Override Extension defines a system for numbering of components.

392

- 393 - Each Input-Document has a number. The single Input-Document that a client sends with Print-Job or Print-URI and the  
394 first Input-Document that a client sends with Send-Documents or Send-URI has a number of 1. Each subsequent Input-  
395 Document that a clients sends has a number that is one higher than the previous.
- 396 - Each Input-Page in an Input-Document is numbered sequentially, starting at 1 for the first Input-Page. If a Job has  
397 several Input-Documents, the first Input-Page of each Input-Document has the number of 1, which is relative to that  
398 Input-Document.
- 399 - Each Output-Document has a number. The first Output-Document has a number of '1', and each subsequent Output-  
400 Document has a number that is one higher than the previous Output-Document. The Output-Documents are numbered as  
401 if the value of "copies" were 1, i.e. if an Input-Document produces multiple copies, each copy of a particular Output-  
402 Document has the same number.
- 403 - Each Output-Page in an Output-Document is numbered sequentially, starting at 1 for the first Output-Page. If a Job has  
404 several Output-Documents, the first Output-Page of each has the number of 1, which is relative to that Output-Documents
- 405 - Each copy of an Output-Document has a number. The first copy of each Output-Document has a number of '1', and each  
406 subsequent copy has a number that is one higher than the previous copy. If a job has multiple Output-Documents, the  
407 first copy of each has a number of '1'.

## 408 4.2 Relationship of Numbered Components

409 The previous section described how to number Input-Documents, Output-Documents, Input-Pages and Output-Pages. This  
410 section describes the relationship between the number on each of these four components. The relationship differs for each of the  
411 five cases defined in section 2.11. The following diagrams of tree structure show each of the five cases and the relationship of the  
412 numbers in those cases.

413

414 These diagrams assume that the number of copies of Output-Documents is 1. When the number of copies exceeds 1, some parts  
415 of these diagrams would have further replication, but the numeric relationships of the four displayed components would not  
416 change.

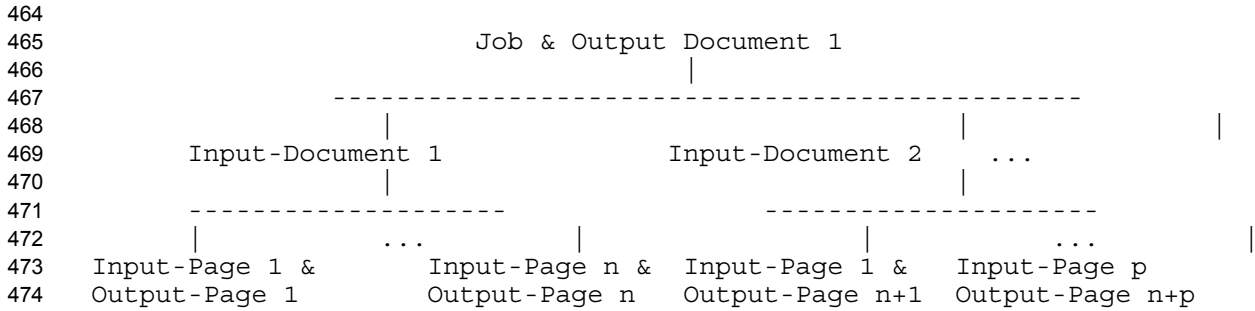
417



459 - Output-Document i coincides with Input-Document i  
460

461 - Output-Page i coincides with Input-Page i  
462

463 **4.2.3 Single-Document Case:**



475 Conditions that define this case:

- 476 - Job contains more than one or more Input-Documents, though one Input-Document is technically the Degenerate Case.
- 477 - “multiple-document-handling” is 'single-document' or 'single-document-new-sheet';

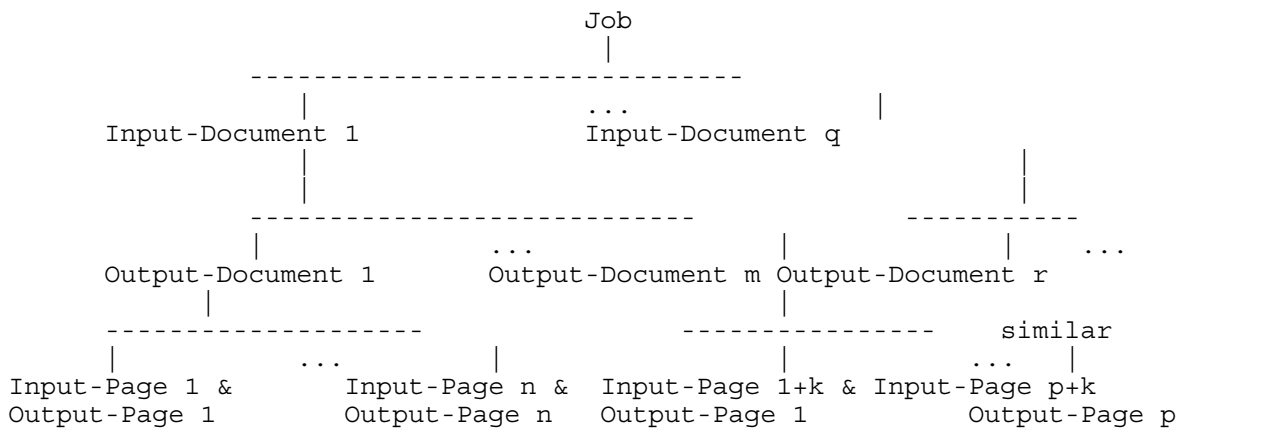
480 Observations about this case:

- 481 - Output-Document 1 coincides with the Job
- 482 - The numbering of Output-Pages is continuous through all Input-Documents, but the numbering of Input-Pages starts at 1 in each Input-Document. That is, Input-Page i in Input-Document m coincides with Output-Page i + k, where k is the number of Input-Pages in all previous Input-Documents, i.e. Input-Documents 1 through m-1.
- 483 - “pages-per-subset” is ignored if present
- 484 - “documents-per-subset” is ignored if present

488

489 **4.2.4 Page-Subset Document Case:**

490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506



507 Conditions that define this case:

- 508 - Job contains one or more Input-Documents
- 509
- 510 - “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies'
- 511 - “pages-per-subset” is present.
- 512 - “documents-per-subset” is not present

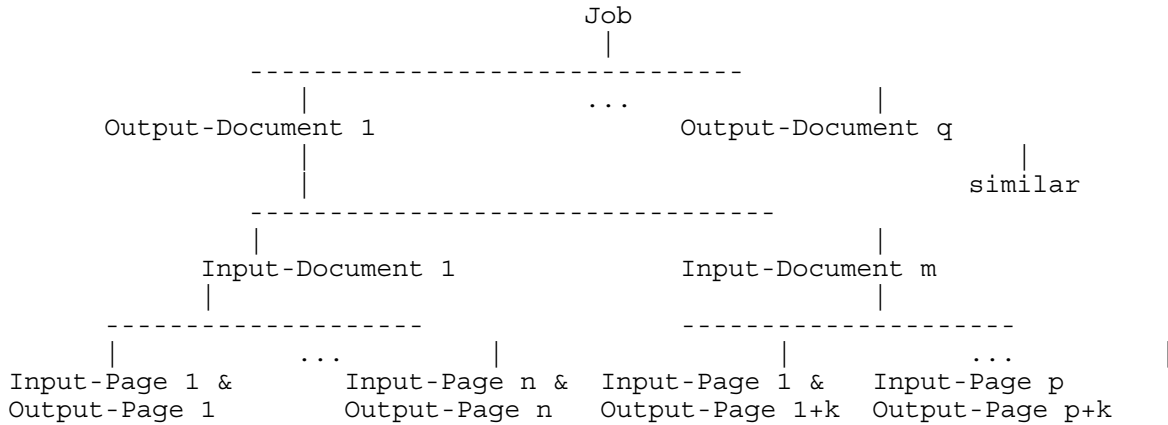
513 Observations about this case:

- 514
- 515 - The diagram shows that Output-Documents 1 through m are contained in Input-Documents 1, and Output-Documents m+1 through t are contained in Input-Documents 2 and so on. However, this diagram is not completely accurate. The Input-Pages from all Input-Documents are more accurately viewed as a continuous stream of Input-Pages that are partitioned into Output-Documents as specified by the attribute “pages-per-subset”. For example, an Output-Document could come from the last 3 Input-Pages of an Input-Documents and the first 4 Input-Pages of the next Input-Documents.
- 516
- 517
- 518
- 519
- 520 - The Input-Pages in each Input-Documents are numbered sequentially starting from 1 and the Output-Pages in each Output-Documents are numbered sequentially starting from 1. For the first Output-Documents, the numbers of the Input-Pages and Output-Pages coincide. For subsequent Output-Documents, the numbers differ. For example, the first Output-Page of the second Output-Documents coincides with Input-Page w, where w is the number of Output-Pages in the first Output-Documents. To be specific, Output-Page i in Output-Documents m coincides with Input-Page i + k of the Job, where k is the number of Output-Pages in all previous Output-Documents of the job, e.g. Output-Documents 1 through m-1.
- 521
- 522
- 523
- 524
- 525
- 526
- 527 - “pages-per-subset” specifies the number of pages in each Output-Documents.

528

529 **4.2.5 Document-Subset Document Case:**

530  
531 NOTE: this case is here for completeness and is not supported by the Overrides-Extension.



549 Conditions that define this case:

- 550 - Job contains one or more Input-Documents
- 551 - “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies'
- 552 - “pages-per-subset” is not present.
- 553 - “documents-per-subset” is present

555 Observations about this case:

- 556 - Input-Documents 1-m are contained in Output-Documents 1, and Input-Documents m+1 through t are contained in Output-Documents 2 and so on.
- 557 - Input-Page i in Input-Documents m coincides with Output-Page i + k of Output-Documents j, where k is the number of Input-Pages in all previous Input-Documents of Output-Documents j, e.g. Input-Documents 1 through m-1.
- 558 - “documents-per-subset” has the number of Input-Documents in each Output-Documents.

562 **4.3 Association of Attributes**

563 The Override Extension allows attribute associations with Input-Pages, Output-Pages, Input-Documents and Output-Documents,  
564 and it continues to allow associations with Jobs. The Override Extension specifies rules for associations, and it categorizes  
565 attributes according to what they affect. The categories of attributes and the members in the Overrides-Extension are:

- 566 - Input Documents: “page-ranges”, “document-format”, “document-name”, “compression” and “document-natural-language”.



- 569 - Output-Documents: “finishings”
- 570 - Sheets: “media” and “sides”

571 The table below shows what each of the three categories of attributes can be associated with:

572

Associates with:	Category of attribute		
	Input-Document	Output-Document	Sheets
Input-Document	yes	yes	yes
Output-Document	no	yes	yes
Input-Page	no	no	yes
Output-Page	no	no	yes

573

574 The meaning of these associations and their limitation is specified in section 16.

575

576 The Override-Extension mechanism seems to be general enough to add new Document-Overrides and Page-Overrides attributes  
 577 without changing or extending the general mechanism. That is, an existing or new Job attribute becomes a Document-Overrides  
 578 or Page-Overrides attribute when a description of that attributes says so, but no changes need be made to the ways overrides  
 579 work. If the new attribute belongs to one of the three above categories, it follows the rules of that category. If it belongs to a new  
 580 categories, the rules of association must be defined.

581 **4.4 Effect of the “document-copies” attribute**

582 The “document-copies” attribute causes some copies of a document to be printed differently from others. For example, 10 copies  
 583 are duplex printed on letter paper with a staple. One copy is simplex printed on transparencies without a staple. As another  
 584 example, the first page of 100 copies of a 3 page document are printed on letterhead paper and the first page of the 101<sup>st</sup> copy of  
 585 the document is printed on regular letter paper.

586

587 If an attribute can affect an Output-Document, it can affect particular Output-Document-Copies. If an attribute can affect Sheets,  
 588 it can affect Sheets of particular Output-Document-Copies.

589

590 Normally, when an attribute is associated with Input-Documents, Output-Documents, Input-Pages or Output-Pages, that attribute  
 591 is effectively associated with corresponding Input-Documents, Output-Documents or Sheets. When an association includes the  
 592 “document-copies” attribute, it has the following meaning for each effective association. If the attribute effectively associates  
 593 with:

594

- 595 - Input-Documents, the Printer ignores the “document-copies” attribute.
- 596 - Output-Documents, the attribute affects the specified copies of the Output-Documents.
- 597 - Sheets: the attribute affects the sheets of the specified copies of Output-Documents.

598 **4.5 Subset Finishing**

599 In IPP/1.1 a Printer applies the “finishings” attribute to all Output-Documents in a given job. This proposal supports “Subset  
 600 Finishing” which we define as the ability to partition the Input-Pages of an Input-Document into one or more Output-Documents  
 601 and to apply different types of finishing to each of the individual Output-Documents contained within a single job.

602

603

604

605

606

607

608

609

610

611

This model supports subset finishing with the new attribute “pages-per-subset” which specifies the number of Input-Pages per Output-Documents. This model treats Subset-Finishing as a Job level sub-setting of the Input-Documents into Output-Documents and as a Document Override attribute rather than a Page Override attribute for two reasons.

- Page-Overrides, as their name suggests, are overrides for a few Input-Pages or Output-Pages that differ from the rest of the Input-Pages or Output-Pages in the Job. With Subset-Finishing, all Input-Pages belong to some subset. So, sub-setting is not an override; it encompasses the entire Job. Only the finishing part of Subset-Finishing can have overrides and those overrides apply to a subset, much like they apply to Output-Documents. Because subsets behave like Output-Documents, it is easiest to describe the sub-setting operation as creating Output-Documents.
- If the attributes “media”, “sides” and “finishings” were all treated as Page-Override attributes, then there would have to one rule for splitting and merging groups when “finishings” is associated with the group and another rule when it is not associated with the group. If a Page-Override specifies “sides” is duplex for pages 1-10 and “media” is added to pages 5 and 6, there can be three Page-Override groups, one for pages 1-4 with “sides”, one for pages 5 and 6 with “sides” and “media” and one for pages 7-10 with sides. If “media” is removed, the groups can be merged back to the original single group. If “finishings = staple” had been present in the original group of pages 1-10, such a split would change finishing from one staple in pages 1-10 to 3 staples, one in pages 1-6, one in page 5-6 and one in pages 7-10.

612

613

614

615

616

617

618

619

620

The remainder of this document describes the changes necessary to support the Overrides Extension.

621

### 5. New Job Template Attributes

622

623

624

The Override Extension adds three new Job Template attributes: “document-overrides”, “page-overrides” and “pages-per-subset”. The first two attributes support override attributes, and the third supports subset finishing.

625

626

627

628

629

630

631

632

633

634

635

636

637

638

639

640

641

Job Attribute	Printer: Default Value Attribute	Printer: Supported Values Attribute
document- overrides (1setOf collection)	none	document-overrides- supported (1setOf type2 keyword)
page-overrides (1setOf collection)	none	page-overrides- supported (1setOf type2 keyword)
pages-per-subset (1setOf integer)	none	pages-per-subset supported (boolean)

## 642 **5.1 document-overrides (1setOf collection)**

643 This OPTIONAL Job Template attribute contains attributes that are associated with Input-Documents and Output-Documents and  
644 that are treated as document overrides. Such attributes are called “Document-Overrides” attributes. The remainder of this section  
645 describes features that an implementation MUST support or MAY support if an implementation supports this attribute.

646  
647 If this attribute is not present in a Job, there are no Document-Overrides within the Job. If it is present, the value consists of one  
648 or more ‘collection’ values, where each ‘collection’ value identifies one or more Input-Documents or Output-Documents and  
649 contains one or more Job Template attributes which act as overrides to the corresponding Job Template attribute values for the  
650 specified Input-Documents or Output-Documents.

651  
652 The first attribute of each ‘collection’ value MUST be either “input-documents” or “output-documents” and this attribute  
653 identifies Input-Documents or Output-Documents, respectively. The second attribute of each ‘collection’ MAY be “document-  
654 copies” and this attribute identifies the Output-Documents. The remaining attributes in the ‘collection’ value are the one or  
655 more Job Template attributes that are overrides for the specified Input-Documents or Output-Documents. The allowed attributes  
656 are listed in section 5.1.8

657 There may be more than one way for a client to arrange Document-Overrides attributes in ‘collection’ values. For example, if a  
658 job contains 10 Output-Documents to be printed 1-sided on letter paper with no stapling and Output-Documents 1 and 2 are to be two  
659 sided with stapling and Document 2 is to be two sided with no stapling, there are two possible ways to group the overrides. The  
660 client could specify the two overrides for Output-Documents 1 and 2 in one ‘collection’ value and the single override for Output-  
661 Document 2 in a second ‘collection’ value, or it could specify “two-sided” for Output-Documents 1 and 2 in one ‘collection’  
662 value and “stapled” for Output-Documents 1 in another ‘collection’ value.

663 If the “input-documents”, “output-documents” or “document-copies” identify Input-Documents, Output-Documents or Output-  
664 Document-Copies that don’t exist, the Printer silently ignores them and associates the Document-Overrides with those Input-  
665 Documents, Output-Documents or Output-Documents-Copies that do exist. A client MUST NOT allow two ‘collection’ values to  
666 be associated with the same Input-Documents, Output-Documents or Output-Documents-Copy and to contain the same Document-  
667 Overrides attribute with different values. If the client violates the preceding rule, the Printer can use either value, and it MUST  
668 issue a warning. It does so by adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing the value of the “job-  
669 warnings-count” Job Description attribute by 1. If the Printer detects this conflict while it is processing a Job-Submission  
670 operation, it MUST return the ignored values in the Unsupported attributes.

671 When a Client receives this attribute in a Get-Jobs or Get-Job-Attributes, the value MUST contain the same ‘collection’ values  
672 received in Job-Submission operations, except for those ‘collection’ values the Printer returned in the Unsupported Attributes.

673 Each ‘collection’ value of this attribute has either of the two forms as defined below. The ‘collection’ values NEED NOT all be  
674 of the same form.

675 For the first form, the client MUST supply “input-documents” as the first attribute. If the client supplies the “document-copies”  
676 attribute, it MUST be the second attribute. The client OPTIONALLY supplies the remaining attributes in any order. If the Printer  
677 supports the Create-Job operation, then it MUST support the attribute labeled with “CMUST” below; otherwise support is  
678 OPTIONAL.

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
input-documents	<a href="#">1setOf</a> rangeOfInteger(MAX)	MUST	MUST
document-copies	<a href="#">1setOf</a> rangeOfInteger(MAX)	MAY	MAY
document-format	mimeMediaType	MAY	CMUST
document-name	name (MAX)	MAY	CMUST
compression	type3 keyword	MAY	CMUST
document-natural-language	naturalLanguage	MAY	MAY
page-ranges	1 setOf rangeOfInteger (1:MAX)	MAY	MAY
finishings	1 setOf type2 enum	MAY	MAY
sides	type2 keyword	MAY	MAY
media	type3 keyword   name(MAX)	MAY	MAY

679 For the second form, the client MUST supply “output-documents” as the first attribute. If the client supplies the “document-  
 680 copies” attribute, it MUST be the second attribute. The client OPTIONALLY supplies the remaining attributes in any order.

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
output-documents	<a href="#">1setOf</a> rangeOfInteger(MAX)	MUST	MUST
document-copies	<a href="#">1setOf</a> rangeOfInteger(MAX)	MAY	MAY
finishings	1 setOf type2 enum	MAY	MAY
sides	type2 keyword	MAY	MAY
media	type3 keyword   name(MAX)	MAY	MAY

681 The following sections describe each member attribute in the above tables.

### 682 5.1.1 input-documents (1setOf rangeOfInteger (1:MAX))

683 This attribute identifies one or more Input-Documents by specifying a range of numbers (see section 4.1 for the rules on  
 684 associating a number with each Input-Document ). The Document-Overrides apply to the identified Input-Documents.

685  
 686 A Printer MUST support this attribute. A client MUST supply this attribute in each ‘collection’ value and it MUST be  
 687 the first attribute of each ‘collection’ value. If this attribute is present, then the client MUST NOT supply “output-  
 688 documents”.

689  
 690 When a client supplies this attribute in a “document-overrides” attribute of a Send-Document or Send-URI request, this  
 691 attribute MUST NOT identify Input-Documents which were sent in an earlier operation. If a Printer receives such a  
 692 value in a ‘collection’ value, it MUST treat all attribute values in such a ‘collection’ value, but not other sibling  
 693 ‘collection’ values, as unsupported values and return the entire collection value in the Unsupported Attributes group.

694  
 695 Note: because the Printer silently ignores values that reference non-existent Input-Documents, a value of ‘MAX’ is  
 696 equivalent to the number of Input-Documents.

697  
 698 See section 5 for details of usage of this attribute.

699  
 700 There is no “input-documents-supported” attribute, since the member attribute MUST be supported and for the full  
 701 range.  
 702

### 703 **5.1.2 output-documents (1setOf rangeOfInteger (1:MAX))**

704 This attribute identifies one or more Output-Documents by specifying a range of numbers (see section 4.1 for the rules  
705 on associating a number with each Output-Document). The Document-Overrides apply to the identified Output-  
706 Documents.

707 A Printer **MUST** support this attribute. A client **MUST** supply this attribute in each ‘collection’ value and it **MUST** be  
708 the first attribute of each ‘collection’ value. If this attribute is present, then the client **MUST NOT** supply “input-  
709 documents”.

710 When a client supplies this attribute in a “document-overrides” attribute of a Send-Document or Send-URI request, this  
711 attribute **MUST NOT** identify Output-Documents whose first Input-Page was sent in an earlier operation. If a Printer  
712 receives such a value in a ‘collection’ value, it **MUST** treat all attribute values in such a ‘collection’ value, but not other  
713 sibling ‘collection’ values, as unsupported values and return the entire collection value in the Unsupported Attributes  
714 group.  
715

716 Note: because the Printer silently ignores values that reference non-existent Output-Documents, a value of ‘MAX’ is  
717 equivalent to the number of Output-Documents.  
718

719 There is no “output-documents-supported” attribute, since the member attribute **MUST** be supported and for the full  
720 range.  
721

### 722 **5.1.3 document-copies (1setOf rangeOfInteger (1:MAX))**

723 This attribute identifies one or more Output-Document-Copies by specifying a range of numbers. The Document-  
724 Overrides apply to the identified Output-Document-Copies within Output-Documents specified either directly by  
725 “output-documents” or indirectly by “input-documents” (see section 16 for further details).

726 A Printer **MAY** support this attribute. A client **MAY** supply this attribute in each ‘collection’ value. If the client supplies  
727 this attribute, it **MUST** be the second attribute of each ‘collection’ value. If this attribute is present, then the client  
728 **MUST** also supply “input-documents” or “output-documents”.

729 If the first member attribute is “input-documents”, this attribute applies only to the other member attributes that affect  
730 Output-Documents and Sheets. The Printer **MUST** ignore this attribute for the other member attributes that affect Input-  
731 Documents.

732 Note: because the Printer silently ignores values that reference non-existent copies, a value of ‘MAX’ is equivalent to  
733 the number of copies.  
734

735 There is no “document-copies-supported” attribute, since the full range **MUST** be supported, if the “document-copies”  
736 member attribute is supported.

### 737 **5.1.4 document-format (mimeMediaType)**

738 This attribute has the same meaning as in IPP/1.1. It indicates the document-format for one or more specified Input-  
739 Documents. The Printer **MUST** support this attribute. A client **OPTIONALLY** supplies it.

### 740 **5.1.5 document-name (name (MAX))**

741 This attribute has the same meaning as in IPP/1.1. It indicates the document-name for one or more specified Input-  
742 Documents. The Printer MUST support this attribute. A client OPTIONALLY supplies it.

### 743 **5.1.6 compression (type3 keyword)**

744 This attribute has the same meaning as in IPP/1.1. It indicates the compression for one or more specified Input-  
745 Documents. The Printer MUST support this attribute. A client OPTIONALLY supplies it.

### 746 **5.1.7 document-natural-language (naturalLanguage)**

747 This attribute has the same meaning as in IPP/1.1. It indicates the document-natural-language for one or more specified  
748 Input-Documents. The Printer MAY support this attribute. A client OPTIONALLY supplies it.

### 749 **5.1.8 page-ranges (1setOf rangeOfInteger (1:MAX))**

750 This attribute has the same meaning as in IPP/1.1. It redefines each Input-Document to contain only the specified Input-  
751 Pages. See section 5.2.3 for how this attribute interacts with “pages”. The “multiple-document-handling” attribute  
752 affects the algorithm for numbering Input-Pages when this attribute is a Job attribute but when it is a Document-Override  
753 attribute. When this attribute is a Document-Override attribute, the values of the “page-ranges” attribute specify the  
754 Input-Pages to select from each of the identified Input-Documents separately. For example, if this attribute has the value  
755 “3:5” and is associated with two Input-Documents A and B, Input-Document A redefined to contain just two pages: 3  
756 and 5, and Input-Document B also contains just pages 3 and 5. The Printer MAY support this attribute. A client  
757 OPTIONALLY supplies it.

758 See section 5.2.4 for details of how this attribute affects number of pages with the “pages” attribute.  
759

### 760 **5.1.9 finishings (1setOf type2 enum)**

761 This attribute has the same meaning as in IPP/1.1. It indicates the finishings for one or more specified Output-  
762 Documents. As a Job Template attribute, it affects each Output-Document produced by the Job. For example, all the  
763 sheets of each Output-Document are stapled together. As a Document-Overrides attributes, it affects only the specified  
764 Output-Documents. The Printer MAY support this attribute. A client OPTIONALLY supplies it.

765 The next section gives further information about this attribute, but this information is the same for all Output-Document  
766 attributes that might be added later.

#### 767 **5.1.9.1 Common Behavior for Output-Document Attributes**

768 This attribute is directly associated with an Input-Document or Output-Document. This means that it is effectively  
769 associated with one or more Output-Documents according to the rules of section 16, and this attribute affects those  
770 Output-Documents.

771

772 If the “document-copies” attribute is present, the attribute affects only the specified copies of the Output-Documents.

### 773 **5.1.10 sides (type2 keyword)**

774 This attribute has the same meaning as in IPP/1.1. It indicates the sides for one or more specified Output-Pages. As a  
775 Job Template attribute, it affects each Sheet produced by the Job. As a Document-Overrides attributes, it affects only the  
776 specified Sheets. The Printer MAY support this attribute. A client OPTIONALLY supplies it.

777 The next section gives further information about this attribute, but this information is the same for all Sheet attributes,  
778 including “media” which is discussed in section 5.1.11

#### 779 **5.1.10.1 Common Behavior for Sheet Attributes**

780 This attribute is directly associated with an Input-Document or Output-Document. This means that it is effectively  
781 associated with one or more Output-Pages according to the rules of section 15, and this attribute affects the Sheets  
782 containing the specified Output-Pages.

783 If the “document-copies” attribute is present, the attribute affects only the Output-Pages in the specified copies of the  
784 Output-Documents.

785 Because this attribute affects a Sheet, but is effectively associated with an Output-Page, a Sheet that contains two or  
786 more Output-Pages may have conflicting values of this attribute. This observation leads to two rules, one for the first  
787 Output-Page that this attribute is effectively associated with and one for the last Output-Page that this attribute is  
788 effectively associated with.

- 789 a) For the first Output-Page: if the value of this attribute is effectively associated with Output-Page *i*, and if  
790 Output-Page *i* is not the first Output-Page contained on a Sheet and if the value of this attribute differs from the  
791 value of this attribute for the preceding Output-Page *i-1*, then Output-Page *i* MUST start a new Sheet and the  
792 Printer MUST issue a warning by adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing  
793 the value of the “job-warnings-count” Job Description attribute by 1.
- 794 b) For the last Output-Page: if the value of this attribute is effectively associated with Output-Page *i*, and if  
795 Output-Page *i* is not the last Output-Page contained on a Sheet and if the value of this attribute differs from the  
796 value of this attribute for the following Output-Page *i+1*, then Output-Page *i+1* MUST start a new Sheet and the  
797 Printer MUST issue a warning by adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing  
798 the value of the “job-warnings-count” Job Description attribute by 1.

### 799 **5.1.11 media (type3 keyword | name(MAX))**

800 This attribute has the same meaning as in IPP/1.1. It indicates the media for one or more specified Output-Pages. As a  
801 Job Template attribute, it affects each Sheet produced by the Job. As a Document-Overrides attributes, it affects only the  
802 specified Sheets. The Printer MAY support this attribute. A client OPTIONALLY supplies it.

803 See section 5.1.10.1 for additional information. The section describes the common behavior of all Sheet attributes.

### 804 **5.1.12 Handling of Error conditions**

805 If a client omits a required member attribute or includes two member attributes that should never both be present (e.g.  
806 “input-document” and “output-document”), a Printer MUST reject all attributes in the ‘collection’ value and treat the  
807 ‘collection’ values, but not other sibling ‘collection’ values, as unsupported.

808 If a client puts a member attribute in some position other than its required position (e.g. “input-documents” MUST be  
809 first), a Printer MUST either:

- 810 a) use the specified value of the member attribute and ignore its wrong position or
- 811 b) reject all attributes in the ‘collection’ value and treat the ‘collection’ values, but not other sibling ‘collection’  
812 values, as unsupported.

### 813 **5.1.13 Why not “document-overrides-default”**

814 There is no “document-overrides-default” attribute because it adds complicated rules for a Printer to implement. The  
815 problems are best illustrated with examples.

816 If there were a “document-overrides-default” and it contained a “sides” and “media” override for the first Output-Page,  
817 and if a client submitted a Job with no “sides” attribute and with “media” as a Job attribute with no overrides, a possible  
818 meaning is that the Printer uses the client’s requested media for the entire Job and the sides specified by the “sides-  
819 default” and the “sides” value in “document-overrides-default”. So in this example, the Printer ignores the “document-  
820 overrides-default” attribute for “media”, but uses it for “sides” because the Printer uses it for an attribute “xxx” only  
821 when it uses “xxx-default”.

### 822 **5.1.14 document-overrides-supported (1setOf type2 keyword)**

823 This attribute specifies the supported values of the “document-overrides” attribute. A client can use this attribute to  
824 determine what Document-Overrides attributes the Printer supports.

825 This attribute contains the name of each attribute that the Printer supports in a ‘collection’ value of the “document-  
826 overrides” attribute. This attribute MUST contain the keywords “input-documents” and “output-documents” because a  
827 Printer MUST support these attributes. This attribute MUST also contain the name of each attribute that can be a  
828 document-override. For example, this attribute contains the keyword “sides” if and only if the Printer supports “sides”  
829 in a ‘collection’ value of the “document-overrides” attribute.

830 There are no corresponding “input-documents-supported”, “output-documents-supported” and “document-copies-  
831 supported” Printer attributes. However, the supported values for all of the other member attributes are indicated by the  
832 corresponding “xxx-supported” Printer attributes which are the same values as for the corresponding “xxx” operation or  
833 Job Template attribute. For example, if “document-format” and “sides” are supported as member attributes of the  
834 “document-exceptions” collection, then the “document-format-supported” and the “sides-supported” Printer attribute  
835 indicates the values that are supported at the job level and as a Document Exception.

836 Standard keyword values are:

- 837 - 'none': no attributes are supported in the “document-overrides” attribute
- 838
- 839 - 'input-documents': the “input-document” member attribute is supported
- 840 - 'output-documents': the “output-document” member attribute is supported
- 841 - 'document-copies': the “document-copies” member attribute is supported
- 842 - 'document-format': The "document-format" member attribute is supported



- 843 - 'document-name': The "document-name" member attribute is supported
- 844 - 'compression': The "compression" member attribute is supported
- 845 - 'document-natural-language': The "document-natural-language" member attribute is supported
- 846 - 'page-ranges': The "page-ranges" member attribute is supported
- 847 - 'finishings': The "finishing" member attribute is supported
- 848 - 'sides': The "sides" member attribute is supported
- 849 - 'media': The "media" member attribute is supported

## 850 **5.2 page-overrides (1setOf collection)**

851 This OPTIONAL Job Template attribute contains attributes that are associated with Input-Pages and Output-Pages and that are  
852 treated as page overrides. Such attributes are called "Page-Overrides" attributes. The remainder of this section describes features  
853 that an implementation MUST support or MAY support if an implementation supports this attribute

854

855 If this attribute is not present in a Job, there are no Page-Overrides attributes within the Job. If it is present, the value consists of  
856 one or more 'collection' values, where each 'collection' value identifies one or more Input-Pages or Output-Pages and contains  
857 one or more Job Template attributes which act as overrides to the corresponding Job Template attributes for the specified Input-  
858 Pages or Output-Pages.

859

860 The first attribute of each 'collection' value MUST be either "input-documents" or "output-documents".

861

862 The second attribute MAY be "document-copies". If present, this attribute identifies the copies of the Output-Documents. If this  
863 attribute is not present in a 'collection' value, then the 'collection' value applies to all Output-Documents-Copies.

864

865 If "document-copies" is present, the "pages" attribute MUST be the third attribute; otherwise, it MUST be the second attribute.

866 The "pages" attribute identifies either

867

868 - the Input-Pages relative to the Input-Document specified by "input-documents" or

869

- the Output-Pages relative to the Output-Document specified by "output-documents".

870 The Page-Overrides attribute applies to the identified Input-Pages or Output-Pages, which need not be contiguous.

871

872 The remaining attributes in the 'collection' value are the Job Template attributes that are overrides for the specified Input-Pages  
873 or Output-Pages.

874

875 There may be more than one way for a client to arrange Page-Override attributes in 'collection' values. For example, if an  
876 Output-Document contains 10 Output-Pages to be printed 1-sided on white letter paper and Output-Page 1 is to be two sided  
877 with blue letter paper and Document 2 is to be two sided with white letter paper, there are two possible ways to group the  
878 overrides. The client could specify the two overrides for Output-Page 1 in one 'collection' value and the single override for  
879 Output-Page 2 in second 'collection' values, or it could specify "two-sided" for Output-Pages 1 and 2 in one 'collection' value  
and "blue letter paper" for Output-Document 1 in another 'collection' value.

880 If the “pages”, “document-copies” and the “input-documents” or “output-documents” identify Input-Pages, Output-Pages that  
 881 either don’t exist or are within nonexistent Output-Document-Copies, Input-Documents or Output-Documents, the Printer silently  
 882 ignores them and associates the Page-Overrides with those Input-Pages or Output-Pages that do exist. A client MUST not allow  
 883 two ‘collection’ values to be associated with the same Input-Page or Output-Page and to contain the same Page-Override  
 884 attribute with different values. If there is such a conflict, the Printer can use either value, and it MUST issue a warning. It does so  
 885 by adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing the value of the “job-warnings-count” Job  
 886 Description attribute by 1. If the Printer detects this conflict while it is processing a Job-Submission operation, it MUST return  
 887 the ignored value in the Unsupported attributes.

888 When a Client receives this attribute in a Get-Jobs or Get-Job-Attributes, the value MUST contain the same ‘collection’ values  
 889 received in Job-Submission operations, except for those ‘collection’ values the Printer returned in the Unsupported Attributes.

890 Each ‘collection’ value of this attribute has either of the two forms as defined below. The ‘collection’ values NEED NOT all be  
 891 of the same form.

892 For the first form, the client MUST supply “input-documents” as the first attribute. If the client supplies the “document-copies”  
 893 attribute, it MUST be the second attribute. The “pages” attribute MUST be the next attribute. The client OPTIONALLY supplies  
 894 the remaining attributes in any order.

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
input-documents	<a href="#">1setOf</a> rangeOfInteger(MAX)	MUST	MUST
document-copies	<a href="#">1setOf</a> rangeOfInteger(MAX)	MAY	MAY
pages	<a href="#">1setOf</a> rangeOfInteger(MAX)	MUST	MUST
sides	type2 keyword	MAY	MAY
media	type3 keyword   name(MAX)	MAY	MAY

895 For the second form, the client MUST supply “output-documents” as the first attribute. If the client supplies the “document-  
 896 copies” attribute, it MUST be the second attribute. Then the “pages” attribute MUST be the next attribute. The client  
 897 OPTIONALLY supplies the remaining attributes in any order.

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
output-documents	<a href="#">1setOf</a> rangeOfInteger(MAX)	MUST	MUST
document-copies	<a href="#">1setOf</a> rangeOfInteger(MAX)	MAY	MAY
pages	<a href="#">1setOf</a> rangeOfInteger(MAX)	MUST	MUST
sides	type2 keyword	MAY	MAY
media	type3 keyword   name(MAX)	MAY	MAY

898 The following sections describe each member attribute in the above table.

899 **5.2.1 input-documents (rangeOfInteger (1:MAX))**

900 See section 5.1.1 for details of this attribute.

901 **5.2.2 output-documents (1setOf rangeOfInteger (1:MAX))**

902 See section 5.1.2 for details of this attribute.

### 903 **5.2.3 document-copies (1setOf rangeOfInteger (1:MAX))**

904 This attribute identifies one or more Output-Document-Copies by specifying a range of numbers. The Page-Overrides  
905 apply to the Output-Pages within the identified Output-Documents-Copies within Output-Documents specified either  
906 directly by “output-documents” or indirectly by “input-documents” (see section 16 for further details).

907 A Printer MAY support this attribute. A client MAY supply this attribute in each ‘collection’ value. It MUST be the  
908 second attribute of each ‘collection’ value if the client supplies it. If this attribute is present, then the client MUST also  
909 supply the “input-documents” or “output-documents” attribute.

910 Note: because the Printer silently ignores values that reference non-existent copies, a value of ‘MAX’ is equivalent to  
911 the number of copies.

912 There is no “document-copies-supported” attribute, since the full range MUST be supported, if the “document-copies”  
913 member attribute is supported.

### 914 **5.2.4 pages (1setOf rangeOfInteger(1:MAX))**

915 This attribute identifies one or more Input-Pages or Output-Pages by specifying one or more ranges of numbers (see  
916 section 4.1 for the rules on associating a number with each Input-Page or Output-Page). The “1setOf” allows  
917 noncontiguous Input-Page or Output-Pages. The Page-Overrides apply to the identified Input-Pages or Output-Pages  
918 within the Output-Documents specified directly by “output-documents” or indirectly by “input-documents”. The  
919 “document-copies” specifies particular copies of Output-Documents.

920 If the “page-ranges” attribute (see section 5.1.8) is associated with an Input-Document, the Input-Pages identified by this  
921 attribute are the same as when “page-ranges” is not present. However, this attribute may identify pages that are  
922 deselected for printing by the “page-ranges” attribute. For example, if the value of “page-ranges” is “5:10” and this  
923 attribute identifies Input-Pages “3:6”, this attribute identifies two Input-Pages (3 and 4) that are not printed and two that  
924 are (5 and 6)

925 If a Printer support the “page-overrides” attribute, it MUST support this attribute. A client MUST supply this attribute in  
926 each ‘collection’ value of the “page-overrides” attribute and it MUST be the second attribute of each ‘collection’ value.

927  
928 When a client supplies this attribute in a Send-Document or Send-URI request, this attribute MUST NOT identify  
929 Output-Pages sent in an earlier operation. If a Printer receives such a value in a ‘collection’ value, it MUST treat all  
930 such values, but not other sibling ‘collection’ values, as unsupported values.

931  
932 Note: because the Printer silently ignores values that reference non-existent pages, a value of ‘MAX’ is equivalent to the  
933 number of pages in each specified Input-Document or Output-Document.

934  
935 There is no “pages-supported” attribute, since the member attribute MUST be supported and for the full range.

936  
937 See section 5 for details of usage of this attribute.

### 938 **5.2.5 sides (type2 keyword)**

939 This attribute has the same meaning as in IPP/1.1. It indicates the sides for one or more specified Output-Pages. As a  
940 Job Template attribute, it affects each Sheet produced by the Job. As a Page-Overrides attributes, it affects only the  
941 specified Sheets. The Printer MAY support this attribute. A client OPTIONALLY supplies it.

942 See section 5.1.10.1 for additional information. The section describes the common behavior of all Sheet attributes.

### 943 **5.2.6 media (type3 keyword | name(MAX))**

944 This attribute has the same meaning as in IPP/1.1. It indicates the media for one or more specified Output-Pages. As a  
945 Job Template attribute, it affects each Sheet produced by the Job. As a Page-Overrides attributes, it affects only the  
946 specified Sheets. The Printer MAY support this attribute. A client OPTIONALLY supplies it.

947 See section 5.1.10.1 for additional information. The section describes the common behavior of all Sheet attributes.

### 948 **5.2.7 Handling of Error conditions**

949 See section 5.1.12.

### 950 **5.2.8 Why not “page-overrides-default”**

951 There is no “page-overrides-default”. See section 5.1.12 for the reasons.

### 952 **5.2.9 page-overrides-supported (1setOf type2 keyword)**

953 This attribute specifies the supported values of the “page-overrides” attribute. A client can use this attribute to determine  
954 what override attributes the Printer supports.

955 This attribute contains the name of each attribute that the Printer supports in a ‘collection’ value of the “page-overrides”  
956 attribute. This attribute MUST contain the keywords “input-documents”, “output-documents” and “pages” because a  
957 Printer MUST support these attributes. This attribute MUST also contain the name of each attribute that can be a page-  
958 override. For example, this attribute contains the keyword “sides” if and only if the Printer supports “sides” in a  
959 ‘collection’ value of the “page-overrides” attribute.

960 There are no corresponding “input-documents-supported”, “output-documents-supported”, “document-copies-  
961 supported”, and “pages-supported” Printer attributes. However, the supported values for all of the other member  
962 attributes are indicated by the corresponding “xxx-supported” Printer attributes which are the same values as for the  
963 corresponding “xxx” operation or Job Template attribute. For example, if “sides” is supported as a member attribute of  
964 the “page-exceptions” collection, then the “sides-supported” Printer attribute indicates the values that are supported at  
965 the job level and as a Page Exception.

966  
967 Standard keyword values are:

- 968 - 'none': no attributes are supported in the “page-overrides” attribute  
969

- 970 - 'input-documents': the "input-document" member attribute is supported
- 971 - 'output-documents': the "output-document" member attribute is supported
- 972 - 'document-copies': the "document-copies" member attribute is supported
- 973 - 'pages': The "pages" member attribute is supported
- 974 - 'sides': The "sides" member attribute is supported
- 975 - 'media': The "media" member attribute is supported

### 976 **5.3 pages-per-subset (1setOf integer)**

977 A client OPTIONALLY supplies this attribute, and a Printer OPTIONALLY supports this attribute. If a Printer supports the  
978 Page-Subset Document Case, it MUST support this attribute.

979

980 When this attribute is present, it effectively partitions one or more Input-Documents into contiguous subsets of Input-Pages.  
981 Each subset is defined to be an Output-Document

982

983 The value of the attribute is a set of one or more integers, where each integer specifies the number of Input-Pages in a subset, and  
984 the set is treated as a repeating sequence of integers. Thus, when the attribute contains a single integer, the integer specifies the  
985 number of Input-Pages in each subset, as a repeating sequence of the single integer. When the number of integers in this attribute  
986 exceeds 1, the first integer specifies the number of Input-Pages in the first subset, the second integer specifies the number of  
987 Input-Pages in the second subset and so on. If numbers in this attribute are exhausted before partitioning all of the Input-Pages,  
988 the Printer starts at the beginning of the sequence again and continues until all Input-Pages are partitioned.

989

990 If the job contains more than one Input-Document, the Input-Pages are treated as a single stream of Input-Pages which are  
991 partitioned into contiguous subsets with some subsets possibly belonging to more than one Input-Document.

992

993 If the number of Input-Pages available for the last subset is less than the number specified by this attribute, the Printer MUST  
994 treat the last subset as an Output-Document and MUST issue a warning by adding 'job-warnings-detected' to the "job-state-  
995 reasons" and by increasing the value of the "job-warnings-count" Job Description attribute by 1.

996

997 If the "multiple-document-handling" attribute is present and has the value 'separate-documents-collated-copies' or 'separate-  
998 documents-uncollated-copies', the Printer MUST use this attribute; otherwise (i.e. the value of the "multiple-document-handling"  
999 attribute has the value 'single-document' or 'single-document-new-sheet'), the Printer ignores this attribute.

#### 1000 **5.3.1 Why not "pages-per-subset-default"**

1001 There is no "pages-per-subset-default" because there is no mechanism for a client to specify that there are no Input-Page subsets  
1002 except to omit this attribute, which would cause the Printer to use the "pages-per-subset-default" attribute and create the default  
1003 subsets. Without this attribute, a client can achieve subsets only by including the "pages-per-subset" attribute in the Job and the  
1004 default is no subsetting. Also, if there were a defaulting mechanism, it isn't clear that customers would use the same partitioning  
1005 over and over.

### 1006 **5.3.2 pages-per-subset-supported (boolean)**

1007 This attribute specifies whether the Printer supports the Page-Subset Document Case. If the attribute is present and has a value of  
1008 “true”, the Printer supports the Page-Subset Document Case. Otherwise, the Printer doesn’t support the Page-Subset Document  
1009 Case.

1010 Note: if the value of this attribute is ‘true’, then the rules described elsewhere in this document imply that:

- 1011 a) Any attribute that affects an Output-Document affects an Output Document created with the “pages-per-subset”  
1012 attribute.
- 1013 b) Any attribute that affects an Output-Page affects the Output-Page of an Output-Document created with the “pages-  
1014 per-subset” attribute.

## 1015 **6. New Job Description attributes**

### 1016 **6.1 job-warnings-count (integer)**

1017 This OPTIONAL attribute specifies the total number of warnings that a Printer has generated while processing and printing the  
1018 Job. At the beginning of a Job, the value MUST be 0. It MUST increase by 1, each time the Printer generates a warning.

## 1019 **7. New Job Description Values**

### 1020 **7.1 job-warnings-detected value for job-state-reasons (1setOf type2 keyword)**

1021 If the Printer supports the value ‘job-warnings-detected’, the Printer MUST add it to “job-state-reasons” when it generates the  
1022 first warning message. That is, a single occurrence of this value is present in the “job-state-reasons” if the Printer has generated  
1023 one or more warnings.

## 1024 **8. Extended Role of Some Operation Attributes**

1025 In IPP/1.1, the following attributes are operation attributes in all Job-Submission operations except Create-Job, but the Printer  
1026 doesn’t put their values into the Job object.

- 1027
- 1028 - document-format
  - 1029 - document-name
  - 1030 - compression

1031 - document-natural-language

1032

1033 With the Override Extension, these attributes also become:

1034

1035 - Operation attributes in the Create-Job and Validate-Job operation when all or most Input-Documents have the same  
1036 attribute value.

1037

- Job Template attributes, so their values are accessible to a client via the Get-Job-Attributes and Get-Jobs operation.

1038

- Job Description attributes, for legacy reasons so their values are accessible to a client via the Get-Job-Attributes and

1039

Get-Jobs operation via the Job Description group name.

1040

- Document-Overrides attributes, so the values are associated with one Input-Document (possible in IPP/1.1) and a client

1041

can query the attributes via Get-Job-Attributes and Get-Jobs operation (not possible in IPP/1.1).

1042

If a Printer supports the Override Extension and if it supports an attribute in this section, it MUST support the attribute in the  
1043 three contexts above. In IPP/1.1, a Printer MUST support all attributes in this section except the “document-natural-language”  
1044 attribute. This effectively means that if a Printer supports this extension, it MUST support all of the attributes in this section  
1045 except “document-natural-language” in the three contexts described above.

1046

1047

When one of the attributes in this section is an operation attribute in Print-Job, Print-URI or Create-Job, it becomes a Job  
1048 Template attribute in the newly created Job object. If one of these attributes is a Document-Overrides attribute, that attribute  
1049 overrides the Job level attribute for the specified Input-Document.

1050

1051

When one of the attributes in this section is an operation attribute in Validate-Job, it is validated as if it were an operation  
1052 attribute of Create-Job.

1053

1054

When one or more of the attributes in this section is an operation attribute in Send-Document or Send-URI request, they are put  
1055 into a ‘collection’ value that is added to the “document-overrides” attribute. See section 5.1 for a discussion of possible conflicts.

## 1056 9. Extensions to Printer Operations

1057

The sections below specify the extensions to the groups within IPP 1.1 operations. If an operation or a group within an operation  
1058 is not mentioned, this extension does not change that operation or group, respectively.

1059

### 1060 9.1 Create-Job and Validate-Job Operation Requests

1061

Attributes are added to the operation attributes group.

1062

1063

Group 1: Operation Attributes

1064

1065

Add the attributes specified in section 6: “document-format”, “document-name”, “compression” and  
1066 “document-natural-language”, so that a client can specify these attributes, at the job level.

## 1067 9.2 Send-Document and Send-URI Operation Requests

1068 Attributes are added to the Operation Attributes group.

1069

1070 Group 1: Operation Attributes

1071

1072 "input-document-number" (integer):

1073

1074

1075

1076

1077

1078

1079

1080

1081

1082

1083

1084

1085

1086

1087

1088

1089

1090

1091

1092

1093

1094

1095

1096

1097

1098

1099

The client OPTIONALLY supplies this attribute in order to inform the printer about the order of documents when the printer is sending the Input-Documents asynchronously. The first Input-Document is 1, and subsequent Input-Documents are numbered sequentially. If the value of “last-document” is ‘true’, then the value of this attribute is also the total number of Input-Documents in the Job. If a client supplies this attribute in one Send-Document or Send-URI operation in a Job, it MUST send it in all such operations. A Printer deals with missing Input-Documents in the same way as without this attribute except that a time-out can occur with Input-Documents anywhere in the Job. For example, a Printer could receive Input-Documents 1 and 3 and not 2.

"document-overrides" (1setOf collection):

The client OPTIONALLY supplies this attribute. See section 5.1 for details. The Printer MUST support this attribute if it supports the “document-overrides” Job Template attribute. If the job doesn’t contain a “document-overrides” attribute, this attribute is added to the Job. Otherwise, the ‘collection’ values from this attribute are appended to the existing “document-overrides” attribute. See section 5.1 for rules of resolving conflicts. Also the “input-documents” attribute is added to any ‘collection’ value that contains neither an “input-documents” nor “output-documents” attribute.

"page-overrides" (1setOf collection):

The client OPTIONALLY supplies this attribute. See section 5.2 for details. The Printer MUST support this attribute if it supports the “page-overrides” Job Template attribute. If the job doesn’t contain a “page-overrides” attribute, this attribute is added to the Job. Otherwise, the ‘collection’ values from this attribute are appended to the existing “page-overrides” attribute. See section 5.2 for rules of resolving conflicts. Also the “input-documents” attribute is added to any ‘collection’ value that contains neither an “input-documents” nor “output-documents” attribute.

## 1100 10. Examples

1101 This section currently contains 3 examples for various relationships of Input-Documents and Output-Documents. The first  
1102 example is for the Degenerate Case only. The second and third cases are for the Separate-Document Case, the Single-Documents  
1103 Case and the Page-Subset Documents Case.

1104

1105

Brackets are used to delimit the beginning and end of each Collection value.

### 1106 10.1 First Page of Single Document is Letterhead

1107 In the first example, the Printer produces 1 copy of a single Output-Document. It is printed on letter-  
1108 paper using Print-Job. The first Output-Page of the Output-Document is letterhead paper.



1109

1110

### 10.1.1 Degenerate Case.

1111

There is one Input-Document A which produces one Output-Document.

1112

1113

Print-Job

1114

  job attributes group

1115

    media: letter

1116

    page-overrides: {

1117

      output-documents: 1:1           (I could have used input-documents: 1:1 as well)

1118

      pages: 1:1

1119

      media: letterhead }

1120

  end-of-attributes

1121

  Input-Document A

1122

1123

## 10.2 First Page of Several Documents is Blue

1124

In the second example, the Printer produces 3 copies of each Output-Document. Each is stapled and printed on letter-paper, two-sided using Create-Job. The first Output-Page of each Output-Document is blue-letter paper and one-sided. All Input-Documents are PostScript.

1125

1126

1127

Attributes that differ between cases are in bold. The values for the attribute “input-documents” changes with each example, but could be “1:100” for all.

1128

1129

1130

### 10.2.1 Separate-Documents Case.

1131

There are two Input-Documents A and B which produce two Output-Documents.

1132

1133

Create-Job

1134

  operations attributes group

1135

    document-format: application/PostScript

1136

  job attributes group

1137

\*    **multiple-document-handling: separate-documents-collated-copies**

1138

    sides: two-sided-long-edge

1139

    media: letter

1140

    copies: 3

1141

    finishings: stapling

1142

    page-overrides: {

1143

      output-documents: 1:2           (I could have used input-documents: 1:2 as well)

1144

      pages: 1:1

1145

      sides: one-sided

1146

      media: blue-letter }

1147

  end-of-attributes

1148

Send-Document

1149

  end-of-attributes

1150           Input-Document A  
 1151    Send-Document  
 1152           end-of-attributes  
 1153           Input-Document B  
 1154

## 1155    **10.2.2 Single-Documents Case**

1156    There are two Input-Documents A and B and only one Output-Document.

1157  
 1158    Create-Job  
 1159           operations attributes group  
 1160               document-format: application/PostScript  
 1161           job attributes group  
 1162               **multiple-document-handling: single-document**  
 1163               sides: two-sided-long-edge  
 1164               media: letter  
 1165               copies: 3  
 1166               finishings: stapling  
 1167               page-overrides: {  
 1168                   output-documents: 1:1               (I could have used input-documents: 1:2)  
 1169                   pages: 1:1  
 1170                   sides: one-sided  
 1171                   media: blue-letter }  
 1172           end-of-attributes  
 1173    Send-Document  
 1174           end-of-attributes  
 1175           Input-Document A  
 1176    Send-Document  
 1177           end-of-attributes  
 1178           Input-Document B  
 1179

## 1180    **10.2.3 Page-Subset Documents Case**

1181    There are two Input-Documents A and B. . The first Input-Document contains 10 Pages and the second  
 1182    one 15 pages. There are 7 Output-Documents with 3 pages, 5 pages, 4 pages, 2 pages, 3 pages, 5 pages  
 1183    and 3 pages. The “ pages-per-subset” attributes wraps after the first four Output-Documents and starts  
 1184    with “3” again. After consuming 22 Input-Pages, the next number is “4”, but only 3 pages remain. So  
 1185    the last Output-Document is short. These value show two boundary cases.

1186  
 1187    Create-Job  
 1188           operations attributes group  
 1189               document-format: application/PostScript  
 1190           job attributes group  
 1191               **multiple-document-handling: separate-documents-collated-copies**  
 1192               **pages-per-subset: 3, 5, 4, 2**  
 1193               sides: two-sided-long-edge

```

1194         media: letter
1195         copies: 3
1196         finishings: stapling
1197         page-overrides: {
1198             output-documents: 1:7           (I could have used output-documents: 1:100 to be safe)
1199             pages: 1:1
1200             sides: one-sided
1201             media: blue-letter }
1202     end-of-attributes
1203 Send-Document
1204     end-of-attributes
1205     Input-Document A
1206 Send-Document
1207     end-of-attributes
1208     Input-Document B

```

### 1209 **10.3 First Page is Blue and First Document is not stapled**

1210 In the third example, the Printer produces 3 copies of each Output-Document. Each is stapled and  
 1211 printed on letter-paper, two-sided using Create-Job. The third and fourth Output-Pages of each Output-  
 1212 Document is blue-letter paper and one-sided. The second Output-Document is not stapled. All files are  
 1213 PostScript except the second which is html.

1214  
 1215 Attributes that differ between cases are in bold. The values for the attribute “input-documents” changes  
 1216 with each example, but could be “1:100” for all.

#### 1217 **10.3.1 Separate-Documents Case**

1218 There are two Input-Documents A and B which produce two Output-Documents.

1219  
 1220 Here are three solutions presented here in order to show three different places to put the attributes  
 1221 associated with an Input-Document. The differences are in *bold-italic*.

##### 1222 **10.3.1.1 First solution:**

```

1223 Create-Job
1224     operations attributes group
1225         document-format: application/PostScript
1226     job attributes group
1227         multiple-document-handling: separate-documents-collated-copies
1228         sides: two-sided-long-edge
1229         media: letter
1230         copies: 3
1231         finishings: stapling
1232         document-format: application/PostScript
1233         document-overrides: {
1234             output-documents: 2:2           (I could have used input-documents: 2:2 & merged with next)
1235             finishings: none }

```

```

1236           {
1237           input-documents: 2:2           next value of multi-value
1238           document-format: text/html}
1239           page-overrides: {
1240             output-documents: 1:2       (I could have used input-documents: 1:2 as well)
1241             pages: 3:4
1242             sides: one-sided
1243             media: blue-letter }
1244           end-of-attributes
1245           Send-Document
1246           end-of-attributes
1247           Input-Document A
1248           Send-Document
1249           end-of-attributes
1250           Input-Document B

```

### 1251 **10.3.1.2 Second solution:**

```

1252           Create-Job
1253             operations attributes group
1254             document-format: application/PostScript
1255             job attributes group
1256             multiple-document-handling: separate-documents-collated-copies
1257             sides: two-sided-long-edge
1258             media: letter
1259             copies: 3
1260             finishings: stapling
1261             document-format: application/PostScript
1262             document-overrides: {
1263               output-documents: 2:2
1264               finishings: none }
1265             page-overrides: {
1266               output-documents: 1:2       (I could have used input-documents: 1:2 as well)
1267               pages: 3:4
1268               sides: one-sided
1269               media: blue-letter }
1270             end-of-attributes
1271             Send-Document
1272             end-of-attributes
1273             Input-Document A
1274             Send-Document
1275             Operation attributes group
1276             document-format: text/html
1277             end-of-attributes
1278             Input-Document B

```

### 1279 **10.3.1.3 Third solution:**

```

1280           Create-Job
1281             operations attributes group
1282             document-format: application/PostScript

```

```

1283     job attributes group
1284         multiple-document-handling: separate-documents-collated-copies
1285         sides: two-sided-long-edge
1286         media: letter
1287         copies: 3
1288         finishings: stapling
1289         document-format: application/PostScript
1290         page-overrides: {
1291             output-documents: 1:2           (I could have used input-documents: 1:2 as well)
1292             pages: 3:4
1293             sides: one-sided
1294             media: blue-letter }
1295     end-of-attributes
1296 Send-Document
1297     end-of-attributes
1298     Input-Document A
1299 Send-Document
1300     Operation attributes group
1301     document-overrides: {
1302     input-documents: 2:2
1303     document-format: text/html
1304     finishings: none }
1305 end-of-attributes
1306     Input-Document B

```

### 1307 10.3.2 Single-Documents Case

1308 There are two Input-Documents A and B and only one Output-Document.

1309 Here are three solutions. The Page-Override attributes are in Create-Job in the first solution and in  
1310 Send-Document in the last two solutions. The Document-Override attribute is directly in the operation  
1311 attributes of Send-Document in the first two solutions and in the document-overrides attributes of Send-  
1312 Document in the third solution. The differences are in *bold-italic*.

#### 1314 10.3.2.1 First solution:

```

1315 Create-Job
1316     operations attributes group
1317     document-format: application/PostScript
1318     job attributes group
1319         multiple-document-handling: single-document
1320         sides: two-sided-long-edge
1321         media: letter
1322         copies: 3
1323         finishings: stapling
1324         document-overrides: {
1325             output-documents: 2:2           (This is ignored because there is no 2nd document)
1326             finishings: none }
1327     page-overrides: {

```

1328                    *input-documents: 1:1*                    *(I could have used output-documents: 1:1)*  
 1329                    *pages: 3:4*  
 1330                    *sides: one-sided*  
 1331                    *media: blue-letter }*  
 1332            end-of-attributes  
 1333    Send-Document  
 1334            end-of-attributes  
 1335            Input-Document A  
 1336    Send-Document  
 1337            Operation attributes group  
 1338            *document-format: text/html*  
 1339            end-of-attributes  
 1340            Input-Document B

1341    **10.3.2.2 Second solution:**

1342    Create-Job  
 1343            operations attributes group  
 1344            document-format: application/PostScript  
 1345            job attributes group  
 1346            **multiple-document-handling: single-document**  
 1347            sides: two-sided-long-edge  
 1348            media: letter  
 1349            copies: 3  
 1350            finishings: stapling  
 1351            document-overrides: {  
 1352                output-documents: 2:2                    (This is ignored because there is no 2<sup>nd</sup> document)  
 1353                finishings: none }  
 1354            end-of-attributes  
 1355    Send-Document  
 1356            Operation attributes group  
 1357            *page-overrides: {*  
 1358                *input-documents: 1:1*                    *(I could have used output-documents: 1:1)*  
 1359                *pages: 3:4*  
 1360                *sides: one-sided*  
 1361                *media: blue-letter }*  
 1362            end-of-attributes  
 1363            Input-Document A  
 1364    Send-Document  
 1365            Operation attributes group  
 1366            *document-format: text/html*                    (this can be here or in the document-overrides)  
 1367            end-of-attributes  
 1368            Input-Document B

1369    **10.3.2.3 Third solution:**

1370    Create-Job  
 1371            operations attributes group  
 1372            document-format: application/PostScript  
 1373            job attributes group  
 1374            **multiple-document-handling: single-document**

```

1375         sides: two-sided-long-edge
1376         media: letter
1377         copies: 3
1378         finishings: stapling
1379         document-overrides: {
1380             output-documents: 2:2           (This is ignored because there is no 2nd document)
1381             finishings: none }
1382     end-of-attributes
1383 Send-Document
1384     Operation attributes group
1385         page-overrides: {
1386             input-documents: 1:1           (I could have used output-documents: 1:1)
1387             pages: 3:4
1388             sides: one-sided
1389             media: blue-letter }
1390     end-of-attributes
1391     Input-Document A
1392 Send-Document
1393     Operation attributes group
1394         document-overrides: {
1395             input-documents: 2:2
1396             document-format: text/html }
1397     end-of-attributes
1398     Input-Document B

```

### 1399 10.3.3 Page-Subset Documents Case

1400 There are two Input-Documents A and B. . The first Input-Document contains 10 Pages and the second  
1401 one 15 pages. There are 7 Output-Documents with 3 pages, 5 pages, 4 pages, 2 pages, 3 pages, 5 pages  
1402 and 3 pages. The “pages-per-subset” attributes wraps after the first four Output-Documents and starts  
1403 with “3” again. After consuming 22 Input-Pages, the next number is “4”, but only 3 pages remain. So  
1404 the last Output-Document is short.

```

1405
1406 Create-Job
1407     operations attributes group
1408         document-format: application/PostScript
1409     job attributes group
1410         multiple-document-handling: separate-documents-collated-copies
1411         pages-per-subset: 3, 5, 4, 2
1412         sides: two-sided-long-edge
1413         media: letter
1414         copies: 3
1415         finishings: stapling
1416         document-overrides: {
1417             output-documents: 2:2
1418             finishings: none }
1419         page-overrides: {
1420             output-documents: 1:7           (I could have used input-documents: 1:100 to be safe)
1421             pages: 3:4

```

```

1422         sides: one-sided
1423         media: blue-letter }
1424     end-of-attributes
1425 Send-Document
1426     end-of-attributes
1427     Input-Document A
1428 Send-Document
1429     Operation attributes group
1430         document-format: text/html           (this can be here or in the document-overrides)
1431     end-of-attributes
1432     Input-Document B

```

## 10.4 One document with 100 copies for distribution and one on transparencies.

In the fourth example, the Printer produces 101 copies of the single Output-Document using Print-Job. The first 100 are stapled and printed on letter-paper, two-sided, except the first page is on blue paper, one-sided. The last copy (number 101) is printed on transparencies, one-sided and not stapled. The file is PostScript.

Here are three possible solutions. The first assumes that the job requests 101 letter-paper documents and that the single transparency copy is the override. The second assumes that the job requests 101 transparency documents and that the 100 letter-paper copies are the override. The third assumes that the job requests 101 documents with default characteristics and that both single transparency copy and the 100 letter-paper copies are overrides. The differences are in *bold-italic*.

### 10.4.1 First solution.

```

1445 Print-Job
1446     operations attributes group
1447         document-format: application/PostScript
1448     job attributes group
1449         sides: two-sided-long-edge
1450         media: letter
1451         copies: 101
1452         finishings: stapling
1453         document-format: application/PostScript
1454         document-overrides: {
1455             output-documents: 1:1           (I could have used input-documents: 1:1 as well)
1456             document-copies: 101:101
1457             sides: one-sided
1458             media: transparency
1459             finishings: none }
1460         page-overrides: {
1461             output-documents: 1:1           (I could have used input-documents: 1:1 as well)
1462             document-copies: 1:100
1463             pages: 1:1
1464             sides: one-sided

```



1465                   media: blue-letter }  
 1466           end-of-attributes  
 1467           Input-Document A

## 1468    **10.4.2 Second solution.**

1469    Print-Job  
 1470      operations attributes group  
 1471        document-format: application/PostScript  
 1472      job attributes group  
 1473        **sides: one-sided**  
 1474        **media: transparency**  
 1475        copies: 101  
 1476        **finishings: none**  
 1477        document-format: application/PostScript  
 1478        document-overrides: {  
 1479          output-documents: 1:1                   (I could have used input-documents: 1:1 as well)  
 1480          **document-copies: 1:100**  
 1481          **sides: two-sided-long-edge**  
 1482          **media: letter**  
 1483          **finishings: stapling }**  
 1484        page-overrides: {  
 1485          output-documents: 1:1                   (I could have used input-documents: 1:1 as well)  
 1486          document-copies: 1:100  
 1487          pages: 1:1  
 1488          sides: one-sided  
 1489          media: blue-letter }  
 1490      end-of-attributes  
 1491      Input-Document A

## 1492    **10.4.3 Third solution.**

1493    Print-Job  
 1494      operations attributes group  
 1495        document-format: application/PostScript  
 1496      job attributes group  
 1497        copies: 101  
 1498        document-format: application/PostScript  
 1499        document-overrides: {  
 1500          output-documents: 1:1                   (I could have used input-documents: 1:1 as well)  
 1501          **document-copies: 101:101**  
 1502          **sides: one-sided**  
 1503          **media: transparency**  
 1504          **finishings: none }**  
 1505        {  
 1506          **output-documents: 1:1**                   (I could have used input-documents: 1:1 as well)  
 1507          **document-copies: 1:100**  
 1508          **sides: two-sided-long-edge**  
 1509          **media: letter**  
 1510          **finishings: stapling }**

```

1511         page-overrides: {
1512             output-documents: 1:1           (I could have used input-documents: 1:1 as well)
1513             document-copies: 1:100
1514             pages: 1:1
1515             sides: one-sided
1516             media: blue-letter }
1517     end-of-attributes
1518     Input-Document A

```

## 1519 11. IANA Considerations

### 1520 11.1 Attribute Registration

1521 The attributes defined in this document will be published by IANA according to the procedures in RFC 2911 [RFC2911] section  
 1522 6.2 with the following path:

```

1523         ftp.isi.edu/iana/assignments/ipp/attributes/
1524
1525

```

1526 The registry entry will contain the following information:

1527 Reference:

```

1528 ftp://ftp.pwg.org/pub/pwg/ipp/new_EXC/pwg-ipp-override-attributes.pdf
1529
1530

```

1531 Job Template attributes:	Section:
1532 <a href="#">document-overrides (1setOf collection)</a>	5.1
1533 <a href="#">page-overrides (1setOf collection)</a>	5.2
1534 <a href="#">pages-per-subset (1setOf integer)</a>	5.3

1536 Job Description attributes:	
1537 <a href="#">job-warnings-count (integer)</a>	6.1

### 1539 11.2 Attribute Value Registration

1540 The "job-state-reasons" type2 keyword attribute values defined in this document will be published by IANA according to the  
 1541 procedures in RFC 2911 [RFC2911] section 6.1 with the following path:

```

1542         ftp.isi.edu/iana/assignments/ipp/attribute-values/job-state-reasons/
1543
1544

```

1545 The registry entry will contain the following information:

1546 Reference:

```

1547 ftp://ftp.pwg.org/pub/pwg/ipp/new_EXC/pwg-ipp-override-attributes.pdf
1548
1549

```

1549 Additional type2 keyword values for "job-state-reasons":	Section:
---	----------

1551 [job-warnings-detected](#) 7.1

## 1552 **12. Internationalization Considerations**

1553 The IPP extensions defined in this document require the same internationalization considerations as any of the Job Template  
1554 attributes defined in IPP/1.1 [ipp-mod].

## 1555 **13. Security Considerations**

1556 The IPP extensions defined in this document require the same security considerations as any of the Job Template attributes  
1557 defined in IPP/1.1 [ipp-mod].

## 1558 **14. References**

1559 [ipp-mod]

1560 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and Semantics", <draft-  
1561 ietf-ipp-model-v11-04.txt>, June 23, 1999.

1562 [pwg-prod-print]

1563 Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", <pwg-ipp-prod-print-  
1564 set1-001215.doc, rtf, .pdf>, December 15, 2000.

1565 [RFC2566]

1566 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and Semantics", RFC  
1567 2566, April 1999.

## 1568 **15. Author's Addresses**

1569 Robert Herriot  
1570 Xerox Corp.  
1571 3400 Hill View Ave, Building 1  
1572 Palo Alto, CA 94304  
1573  
1574 Phone: 650-813-7696  
1575 Fax: 650-813-6860  
1576 e-mail: [robert.herriot@pahv.xerox.com](mailto:robert.herriot@pahv.xerox.com)  
1577

1578 Kirk Ocke  
1579 Xerox Corporation  
1580 800 Phillips Road  
1581 Webster, NY 14580  
1582

1583 Phone: 716-422-4832  
1584 e-mail: [Kirk.Ocke@usa.xerox.com](mailto:Kirk.Ocke@usa.xerox.com)

## 1585 **16. Appendix A: Rules for Attribute Association**

1586 For each category of attribute, there is a rule:

- 1587 1. Input-Documents: such an attribute
- 1588 a) cannot be directly associated with Input-Pages, Output-Pages, Output-Documents
- 1589 b) can be directly associated with an Input-Document, and it affects the Input-Document it is associated with.
- 1590 c) can be associated with a Job and it affects all Input-Documents that don't have the attribute associated with it.
- 1591 2. Output-Documents: such an attribute
- 1592 a) can never be directly associated with an Input-Page or Output-Page.
- 1593 b) can be directly associated with an Output-Document, and it affects the Output-Document it is associated with.
- 1594 c) can be directly associated with an Input-Document. If that Input-Document produces a first Output-Page for one or
- 1595 more Output-Documents, the attribute is effectively associated with each such Output-Document that doesn't have
- 1596 the attribute directly associated with it. Now use rule 2b). If that Input-Document doesn't produce any first Output-
- 1597 Pages of an Output-Document, it is ignored and the Printer produces a warning message.
- 1598 d) can be associated with a Job and it affects all Output-Documents that don't have the attribute associated with it.
- 1599 3. Sheets: such attributes
- 1600 a) can be directly associated with an Output-Page, and it affects the associated Output-Page .
- 1601 b) can be directly associated with an Input-Page, and it is effectively associated with the Output-Page determined by
- 1602 the relationship described for the four cases in section 4.2 if that Output-Page doesn't have the attribute directly
- 1603 associated with it. Now use rule 3a)
- 1604 c) can be directly associated with an Output-Document, and it affects all Output-Pages in the specified Output-
- 1605 Document that don't have the attribute associated directly with it or the corresponding Input-Page.
- 1606 d) can be directly associated with an Input-Document, and it is effectively associated with all Input-Pages in the
- 1607 specified Input-Document that don't have the attribute associated directly with it. By transitivity, the attribute is
- 1608 effectively associated with all corresponding Output-Pages (see section 4.2) that don't have the attribute associated
- 1609 directly with the them or the containing Output-Document. Now use rule 3a)
- 1610 e) can be associated with a Job and it affects all Output-Pages that don't have the attribute associated with it.
- 1611

1612 When an association includes the "document-copies" attribute, it modifies the meaning of the above rules slightly for each  
1613 effective association. If the attribute effectively associates with:

- 1614 - Input-Documents, the Printer ignores the "document-copies" attribute.
- 1615
- 1616 - Output-Documents, the attribute affects the specified copies of the Output-Documents (See Item 2b))
- 1617 - Sheets: the attribute affects the sheets of the specified copies of Output-Documents (See Items 3a) and 3c)).

1618

## 1619 **17. Appendix B: Summary of other IPP documents**

1620 The full set of IPP documents includes:

- 1621
- 1622 - Design Goals for an Internet Printing Protocol [RFC2567]
- 1623 - Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
- 1624 - Internet Printing Protocol/1.1: Model and Semantics [RFC2911]
- 1625 - Internet Printing Protocol/1.1: Encoding and Transport [RFC2910]
- 1626 - Internet Printing Protocol/1.1: Implementer's Guide [IPP-IIG]
- 1627 - Mapping between LPD and IPP Protocols [RFC2569]

1628 The "Design Goals for an Internet Printing Protocol" document takes a broad look at distributed printing functionality, and it  
1629 enumerates real-life scenarios that help to clarify the features that need to be included in a printing protocol for the Internet. It  
1630 identifies requirements for three types of users: end users, operators, and administrators. It calls out a subset of end user  
1631 requirements that are satisfied in IPP/1.0. A few OPTIONAL operator operations have been added to IPP/1.1.

1632 The "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol" document describes IPP from a high  
1633 level view, defines a roadmap for the various documents that form the suite of IPP specification documents, and gives  
1634 background and rationale for the IETF working group's major decisions.

1635 The "Internet Printing Protocol/1.1: Encoding and Transport" document is a formal mapping of the abstract operations and  
1636 attributes defined in the model document onto HTTP/1.1 [RFC2616]. It defines the encoding rules for a new Internet MIME  
1637 media type called "application/ipp". This document also defines the rules for transporting over HTTP a message body whose  
1638 Content-Type is "application/ipp". This document defines a new scheme named 'ipp' for identifying IPP printers and jobs.

1639 The "Internet Printing Protocol/1.1: Implementer's Guide" document gives insight and advice to implementers of IPP clients and  
1640 IPP objects. It is intended to help them understand IPP/1.1 and some of the considerations that may assist them in the design of  
1641 their client and/or IPP object implementations. For example, a typical order of processing requests is given, including error  
1642 checking. Motivation for some of the specification decisions is also included.

1643 The "Mapping between LPD and IPP Protocols" document gives some advice to implementers of gateways between IPP and  
1644 LPD (Line Printer Daemon) implementations.

## 1645 **18. Appendix C: Description of the IEEE Industry Standards and** 1646 **Technology (ISTO)**

1647 The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum and support  
1648 services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities that support the  
1649 implementation and acceptance of standards in the marketplace. The organization is affiliated with the IEEE  
1650 (<http://www.ieee.org/>) and the IEEE Standards Association (<http://standards.ieee.org/>).

1651 For additional information regarding the IEEE-ISTO and its industry programs visit:

1652 <http://www.ieee-isto.org>.

## 1655 **19. Appendix D: Description of the IEEE-ISTO PWG**

1656 The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and Technology Organization (ISTO) and is  
1657 an alliance among printer manufacturers, print server developers, operating system providers, network operating systems

1658 providers, network connectivity vendors, and print management application developers chartered to make printers and the  
1659 applications and operating systems supporting them work together better. All references to the PWG in this document implicitly  
1660 mean “The Printer Working Group, a Program of the IEEE ISTO.” In order to meet this objective, the PWG will document the  
1661 results of their work as open standards that define print related protocols, interfaces, procedures and conventions. Printer  
1662 manufacturers and vendors of printer related software will benefit from the interoperability provided by voluntary conformance to  
1663 these standards.  
1664

1665 In general, a PWG standard is a specification that is stable, well understood and is technically competent, has multiple,  
1666 independent and interoperable implementations with substantial operational experience, and enjoys significant public support.  
1667

1668 For additional information regarding the Printer Working Group visit:

1669 <http://www.pwg.org>  
1670

1671