

7 Internet Printing Protocol (IPP): Exception Attributes for Documents and Pages
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9 Status of this Memo

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

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14 Abstract

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

22
23 This extension supports document exceptions and page exceptions by adding two new Job Template
24 attributes: “document-exceptions” and “page-exceptions” -- both have a syntax type of “1setOf collection”.
25 Each ‘collection’ value for “document-exceptions” contains an attribute that identifies the exception
26 documents, namely “input-documents” or “output-documents”. The ‘collection’ value also contains one or
27 more attributes that are exceptions for the identified documents, e.g. “document-format”, “finishings”, and
28 “media”. Each ‘collection’ value for “page-exceptions” contains two attributes that identify the exception
29 pages, namely “input-documents” or “output-documents” plus “pages”. The ‘collection’ value also
30 contains one or more attributes that are exceptions for the identified pages, e.g. “sides” and “media”. When
31 the exceptions applies to some but not all document copies, the ‘collection’ value for “document-
32 exceptions” or “page-exceptions” contains the attribute of “document-copies”.

33
34 This extension also supports subset finishing by adding a new Job Template attribute “pages-per-subset”,
35 which specifies the number of pages per subset. The extension allows finishing and other document
36 attributes to be applied to such subsets of pages.

37
38 The full set of IPP documents includes:

- 39 - Design Goals for an Internet Printing Protocol [RFC2567]
- 40 - Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]

- 41 - Internet Printing Protocol/1.1: Model and Semantics (this document)
- 42 - Internet Printing Protocol/1.1: Encoding and Transport [IPP-PRO]
- 43 - Internet Printing Protocol/1.1: Implementer's Guide [IPP-IIG]
- 44 - Mapping between LPD and IPP Protocols [RFC2569]

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

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

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

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

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

66

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1. Introduction

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The Internet Printing Protocol (IPP) is an application level protocol for distributed printing using Internet tools and technologies. IPP version 1.1 (IPP/1.1) requires that each attribute value be the same for all pages, all documents and all document copies within a job. This document defines OPTIONAL extensions to the IPP/1.1 model which relax this restriction and allow pages, documents and document copies to have attributes that are exceptions. For example, with this extension, page 1 of a job could have 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 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 document is a proposal for an extension to IPP/1.0 and IPP/1.1.

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

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

Each ‘collection’ value for “page-exceptions” contains

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

This extension also supports subset finishing with 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.

193

2. Terminology

194

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

195

2.1 REQUIRED

196

197

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

198 2.2 OPTIONAL

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

201 2.3 Exception-Extension

202 The Exception-Extension is the extension proposed in this document that adds attribute exceptions
203 for documents and pages. This extension supports Document-Exceptions, Page-Exceptions and
204 Subset-Finishing, which are all defined later in this section.

205 2.4 Sheet

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

208 2.5 Output-Page

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

211 2.6 Impression:

212 An impression is the set of all markings that the Job submitter intended to be placed on one side of a
213 Sheet. Each impression contains one or more Output-Pages. Generally a Job submitter prints each
214 Output-Page as the author intended, namely one Output-Page per Impression. Sometimes, a Job
215 submitter prints several Output-Pages per Impression, perhaps to save paper or money. The IPP
216 attribute "number-up" specifies the number of Output-Pages per impression. When "number-up" is
217 greater than 1, an impression contains multiple Output-Pages.

218 2.7 Input-Page

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

226 2.8 Input-Document

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

231 **2.9 Output-Document**

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

- 237
- 238 a) all the Input-Pages of an Input-Document or
- 239 b) a proper subset of the Input-Pages of the Input-Document or
- 240 c) all the Input-Pages of several Input-Documents.
- 241

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

244 **2.10 Output-Document-Copy**

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

248 **2.11 Relationship between Input-Document and Output-Documents**

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

255

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

258

259 The table below summarizes the relationship of Input-Documents to Output-Document in the five
 260 cases:

261

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)

262

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

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

- The “separate” value means that “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies'.
- The “single” value means that “multiple-document-handling” is 'single-document' or 'single-document-new-sheet'.
- The “ignored” value means that the attribute need not be present and is ignored if it is present,
- The “present” value means that the attribute must be present. A different case is implied if it is not present.
- The “not present” value means that the attribute must not be present. A different case is implied if it is present.

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

277
278
279
280
281

The Degenerate row is omitted because it follows the rules for the “Separate-Documents” and “Single-Documents” rules when the number of Input-Documents is 1. There is an error if both “page-per-subset” and “document-per-subset” are present in the “separate” case.

282 **2.11.1 Degenerate Case:**

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

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

295 **2.11.2 Separate Documents Case**

296 In the Separate Documents Case, the Job consists of one or more Output-Documents where
297 each Input-Document produces one Output-Document. For example, if a user prints 10 Java
298 files in one Job and wants 10 separately stapled Output-Documents, each of the 10 Java files

299 is an Input-Document, and the printed Output-Pages from each of the 10 Java files is a
300 separate Output-Document that is stapled separately. This case occurs when “multiple-
301 document-handling” is 'separate-documents-collated-copies' or 'separate-documents-
302 uncollated-copies' and the new attributes “pages-per-subset” and “documents-per-subset” are
303 not present.

304 **2.11.3 Single Document Case**

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

312 **2.11.4 Page-Subset Document Case:**

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

324 **2.11.5 Document-Subset Document Case:**

325 This case is defined here for completeness, but it is not supported by this extension.
326

327 In the Document-Subset Document Case, the Job consists of one or more Output-Documents
328 and one or more Input-Documents. The new attribute “documents-per-subset” contains a
329 sequence of integers which specifies how to partition Job’s Input-Documents into subsets,
330 each of which produces an Output Document. For example, if a user prints 25 Java files in
331 one Job and wants 2 separately stapled Output-Documents, one with 15 Java files and one
332 with 10 Java files, then each of the Java files is an Input-Document, and the printed Output-
333 Pages from the first 15 Java files and next 10 Java files are two separate Output-Documents
334 that are stapled separately. This case occurs when “multiple-document-handling” is
335 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies' and
336 “documents-per-subset” contains 1 or more integer values. The new attribute “pages-per-
337 subset” is not present.
338

339 2.12 Document-Exceptions

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

342 2.13 Page-Exceptions

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

345 2.14 Subset-Finishing

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

349 2.15 Affects

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

358 2.16 Associates

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

362 2.16.1 Directly Associates

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

369 2.16.2 Effectively Associates

370 When an attribute is said to be directly associated with some part of a job ‘A’ that is
371 semantically connected with another part ‘B’, the attribute is said to be “effectively
372 associated” with ‘B’. For example, in the Separate-Documents Case, when an attribute is

373 directly associated with an Input-Document, it is effectively associated with the
374 corresponding Output-Document.

375 **2.17 Job-Submission Operations:**

376 The Job-Submission Operations are the IPP operations that create jobs and send document content,
377 namely Print-Job, Print-URI, Create-Job, Send-Document and Send-URI.

378 **3. Requirements**

379 The following is a list of requirements for the Exceptions-Extension.

- 380
- 381 1. The Exception-Extension **MUST** contain a mechanism for specifying Job attributes that are
382 exceptions for particular Input-Documents or Output-Documents. A Printer and a client
383 **OPTIONALLY** support this mechanism.
- 384 2. There **MUST** be a mechanism for specifying Job attributes that are exceptions for particular Input-
385 Pages or Output-Pages. A Printer and a client **OPTIONALLY** support this mechanism.
- 386 3. There **MUST** be a mechanism for specifying Job attributes that are exceptions for particular
387 document copies of Output-Documents. A Printer and a client **OPTIONALLY** support this
388 mechanism.
- 389 4. The mechanism for exceptions **MUST** be supported by all Job-Submission operations and Validate-
390 Job.
- 391 5. The extension **MUST** support the four relationships of Input-Documents and Output-Documents:
392 Degenerate Case, Separate-Documents Case, Single-Document Case and Page-Subset Document
393 Case.
- 394 6. The extension **MUST** support Subset-Finishing.

395 **4. Overview**

396 In IPP 1.1 all attributes that a client includes with job creation operations affect the entire Job in a uniform
397 way. That is, there is no way for one Output-Document in a given Job to be stapled and another drilled.
398 Also, there is no way for the first sheet of each Output-Document to be on a different media or to have a
399 different value of “sides” from the other Sheets in the Output-Document. In addition, there is no way for
400 one document copy to be printed on paper and another on transparencies. An IPP/1.1 client can specify
401 features, such as finishing, media and sides only at the job level.

402
403 The Exception Extension defined in this document allows some Output-Pages, some Output-Documents
404 and some Input-Documents to be affected by attribute values that are exceptions to those specified for the
405 Job as a whole. For example, the first Output-Page of an Output-Document has a different media from the
406 rest, or the second Output-Document is stapled and the rest are not, or the page-ranges of the first Input-
407 Document selects a few Input-Pages and the rest of the Input-Documents are printed in full, or one copy of
408 an Output-Document has a different media from the rest.

4.1 Numbering of Components

The Exception Extension defines a system for numbering of components.

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

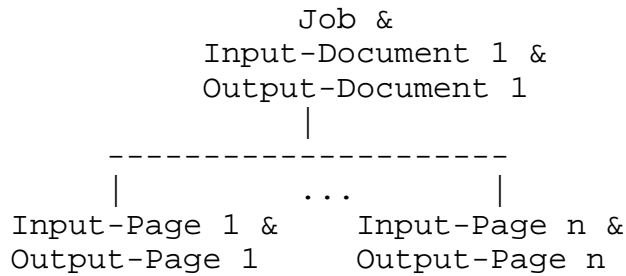
4.2 Relationship of Numbered Components

The previous section described how to number Input-Documents, Output-Documents, Input-Pages and Output-Pages. This section describes the relationship between the number on each of these four components. The relationship differs for each of the five cases defined in section 2.10. The following diagrams of tree structure show each of the five cases and the relationship of the numbers in those cases.

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

439 Degenerate Case:

440
441
442
443
444
445
446
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448
449
450



451 Conditions that define this case:

452
453

- Job contains exactly 1 Input-Document
- Either conditions for “Separate-Documents” or “Single-Documents” are met.

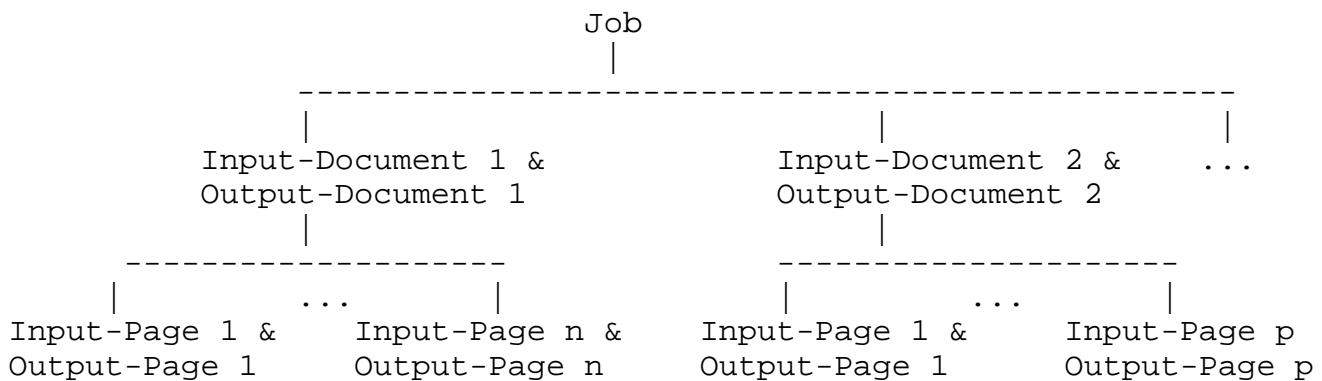
455 Observations about this case:

456
457
458

- Job coincides with Output-Document 1 and Input-Document 1
- Output-Page i coincides with Input-Page i

459 Separate-Documents Case:

460
461
462
463
464
465
466
467
468
469
470
471
472



473 Conditions that define this case:

474
475
476
477
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479

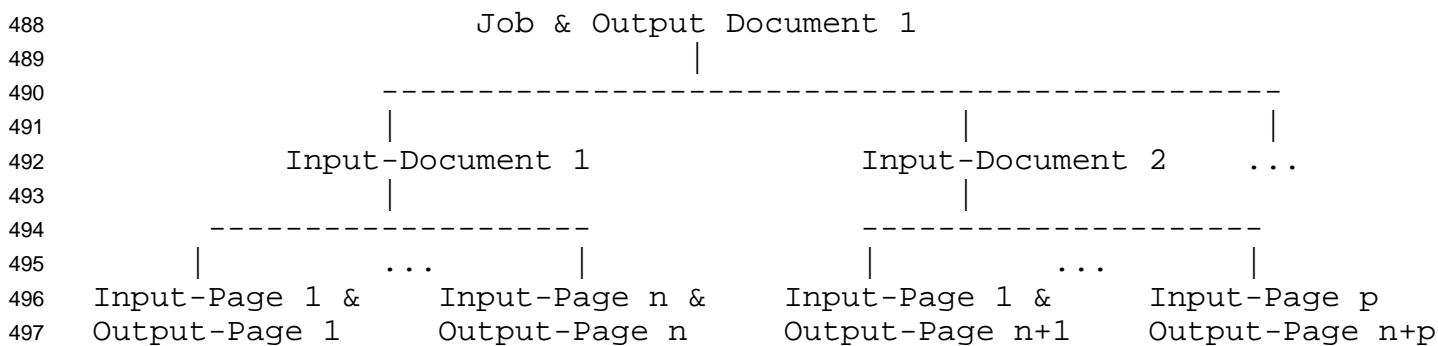
- Job contains more than one or more Input-Documents, though one Input-Document is technically the Degenerate Case.
- “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies'
- “pages-per-subset” is not present

480 - “documents-per-subset” is not present

481 Observations about this case:

- 482 - Output-Document i coincides with Input-Document i
- 483
- 484 - Output-Page i coincides with Input-Page i

485
486 Single-Document Case:



498
499 Conditions that define this case:

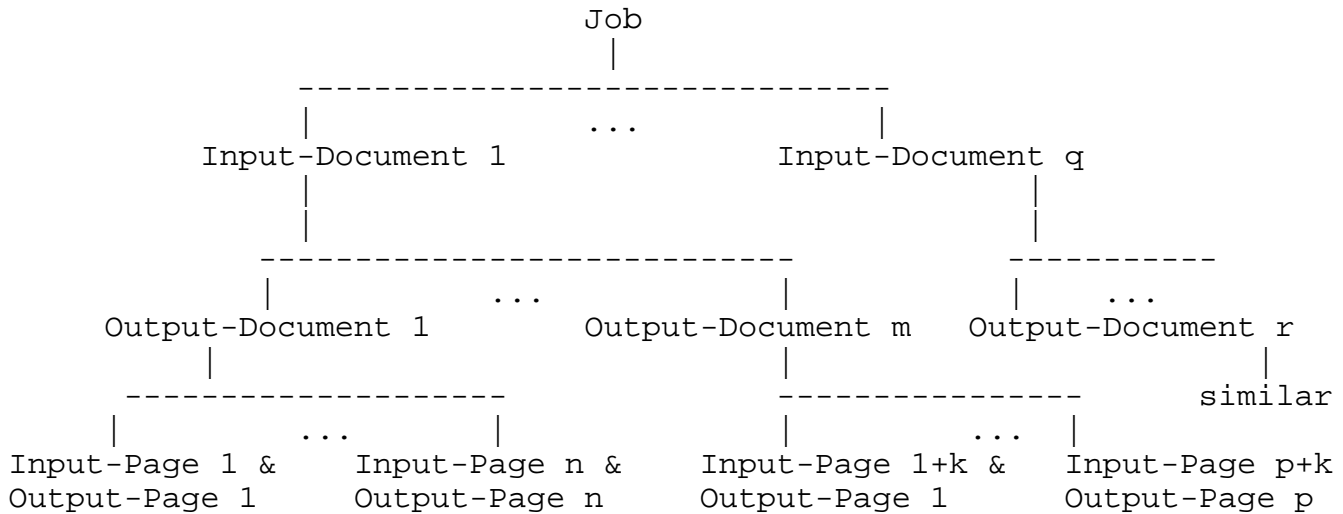
- 500
- 501 - Job contains more than one or more Input-Documents, though one Input-Document is technically
- 502 the Degenerate Case.
- 503 - “multiple-document-handling” is 'single-document' or 'single-document-new-sheet';

504 Observations about this case:

- 505
- 506 - Output-Document 1 coincides with the Job
- 507 - The numbering of Output-Pages is continuous through all Input-Documents, but the numbering of
- 508 Input-Pages starts at 1 in each Input-Document. That is, Input-Page i in Input-Document m
- 509 coincides with Output-Page i + k, where k is the number of Input-Pages in all previous Input-
- 510 Documents, i.e. Input-Documents 1 through m-1.
- 511 - “pages-per-subset” is ignored if present
- 512 - “documents-per-subset” is ignored if present

513

514 Page-Subset Document Case:



532 Conditions that define this case:

- 534 - Job contains one or more Input-Documents
- 535 - “multiple-document-handling” is 'separate-documents-collated-copies' or 'separate-documents-
- 536 uncollated-copies'
- 537 - “pages-per-subset” is present.
- 538 - “documents-per-subset” is not present

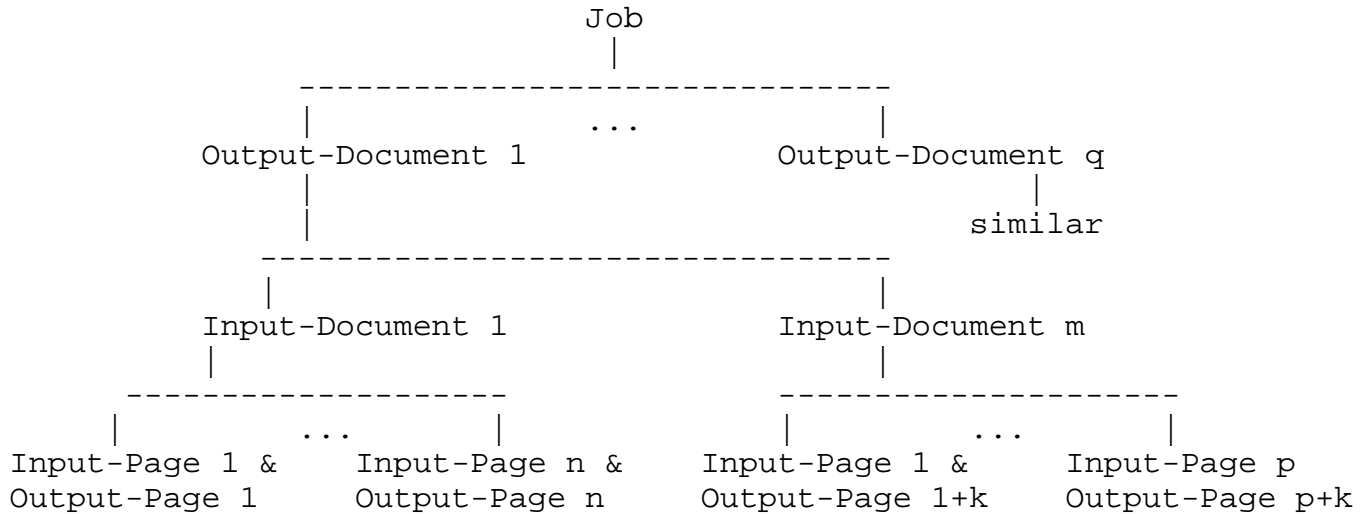
539 Observations about this case:

- 540 - The diagram shows that Output-Documents 1 through m are contained in Input-Documents 1, and
- 541 Output-Documents m+1 through t are contained in Input-Documents 2 and so on. However, this
- 542 diagram is not completely accurate. The Input-Pages from all Input-Documents are more accurately
- 543 viewed as a continuous stream of Input-Pages that are partitioned into Output-Documents as
- 544 specified by the attribute “pages-per-subset”. For example, an Output-Documents could come from
- 545 the last 3 Input-Pages of an Input-Documents and the first 4 Input-Pages of the next Input-Documents.
- 546
- 547 - The Input-Pages in each Input-Documents are numbered sequentially starting from 1 and the Output-
- 548 Pages in each Output-Documents are numbered sequentially starting from 1. For the first Output-
- 549 Documents, the numbers of the Input-Pages and Output-Pages coincide. For subsequent Output-
- 550 Documents, the numbers differ. For example, the first Output-Page of the second Output-Documents
- 551 coincides with Input-Page w, where w is the number of Output-Pages in the first Output-Documents.
- 552 To be specific, Output-Page i in Output-Documents m coincides with Input-Page i + k of the Job,
- 553 where k is the number of Output-Pages in all previous Output-Documents of the job, e.g. Output-
- 554 Documents 1 through m-1.

- “pages-per-subset” specifies the number of pages in each Output-Document.

Document-Subset Document Case:

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



Conditions that define this case:

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

Observations about this case:

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

592 4.3 Association of Attributes

593 The Exception Extension allows attribute associations with Input-Pages, Output-Pages, Input-Documents
 594 and Output-Documents, and it continues to allow associations with Jobs. The Exception Extension specifies
 595 rules for associations, and it categorizes attributes according to what they affect. The categories of attributes
 596 and the members in the Exceptions-Extension are:

- 597 - Input Documents: “page-ranges”, “document-format”, “document-name”, “compression” and
 598 “document-natural-language”.
- 600 - Output-Documents: “finishings”
- 601 - Sheets: “media” and “sides”

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

603

	Category of attribute		
Associates with:	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

604

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

606

607 The Exception-Extension mechanism seems to be general enough to add new Document-Exceptions and
 608 Page-Exceptions attributes without changing or extending the general mechanism. That is, an existing or
 609 new Job attribute becomes a Document-Exceptions or Page-Exceptions attribute when a description of that
 610 attributes says so, but no changes need be made to the ways exceptions work. If the new attribute belongs
 611 to one of the three above categories, it follows the rules of that category. If it belongs to a new categories,
 612 the rules of association must be defined.

613 4.4 Effect of the “document-copies” attribute

614 The “document-copies” attribute causes some copies of a document to be printed differently from others.
 615 For example, 10 copies are duplex printed on letter paper with a staple. One copy is simplex printed on
 616 transparencies without a staple. As another example, the first page of 100 copies of a 3 page document are
 617 printed on letterhead paper and the first page of the 101st copy of the document is printed on regular letter
 618 paper.

619

620 If an attribute can affect an Output-Document, it can affect particular Output-Document-Copies. If an
 621 attribute can affect Sheets, it can affect Sheets of particular Output-Document-Copies.

622

623 Normally, when an attribute is associated with Input-Documents, Output-Documents, Input-Pages or
 624 Output-Pages, that attribute is effectively associated with corresponding Input-Documents, Output-

625 Documents or Sheets. When an association includes the “document-copies” attribute, it has the following
626 meaning for each effective association. If the attribute effectively associates with:

- 627 - Input-Documents, the Printer ignores the “document-copies” attribute.
- 629 - Output-Documents, the attribute affects the specified copies of the Output-Documents.
- 630 - Sheets: the attribute affects the sheets of the specified copies of Output-Documents.

631 4.5 Subset Finishing

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

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

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

657 The remainder of this document describes the changes necessary to support the Exceptions Extension.
658

659 **5. New Job Template Attributes**

660 The Exception Extension adds three new Job Template attributes: “document-exceptions”, “page-
 661 exceptions” and “pages-per-subset”. The first two attributes support exception attributes, and the third
 662 supports subset finishing.

663

664 Job Attribute	665 Printer: Default Value	666 Printer: Supported Values Attribute
667 document-exceptions 668 (1setOf collection)	669 none	670 document-exceptions-supported (1setOf type1 keyword)
671 page-exceptions 672 (1setOf collection)	673 none	674 page-exceptions-supported (1setOf type1 keyword)
675 page-per-subset 676 (1setOf integer)	677 none	678 pages-per-subset-supported (Boolean)

679

680

681 **5.1 document-exceptions (1setOf collection)**

682 This OPTIONAL Job Template attribute contains attributes that are associated with Input-Documents and
 683 Output-Documents and that are treated as document exceptions. Such attributes are called “Document-
 684 Exceptions” attributes. The remainder of this section describes features that an implementation MUST
 685 support or MAY support if an implementation supports this attribute.

686

687 If this attribute is not present in a Job, there are no Document-Exceptions within the Job. If it is present, the
 688 value consists of one or more ‘collection’ values, where each ‘collection’ value identifies one or more
 689 Input-Documents or Output-Documents and contains one or more Job Template attributes which act as
 690 exceptions to the corresponding Job Template attribute values for the specified Input-Documents or Output-
 691 Documents.

692

693 The first attribute of each ‘collection’ value MUST be either “input-documents” or “output-documents” and
 694 this attribute identifies Input-Documents or Output-Documents, respectively. The second attribute of each
 695 ‘collection’ MAY be “document-copies” and this attribute identifies the Output-Documents-Copies. The
 696 remaining attributes in the ‘collection’ value are the one or more Job Template attributes that are exceptions
 697 for the specified Input-Documents or Output-Documents. The allowed attributes are listed in section 5.1.8

698 There may be more than one way for a client to arrange Document-Exceptions attributes in ‘collection’
 699 values. For example, if a job contains 10 Output-Documents to be printed 1-sided on letter paper with no
 700 stapling and Output-Documents 1 is to be two sided with stapling and Document 2 is to be two sided with
 701 no stapling, there are two possible ways to group the exceptions. The client could specify the two

702 exceptions for Output-Document 1 in one ‘collection’ value and the single exception for Output-Document
 703 2 in a second ‘collection’ value, or it could specify “two-sided” for Output-Documents 1 and 2 in one
 704 ‘collection’ value and “stapled” for Output-Document 1 in another ‘collection’ value.

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

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

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

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

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
input-documents	rangeOfInteger(MAX)	MUST	MUST
document-copies	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	1setOf rangeOfInteger (1:MAX)	MAY	MAY
finishings	1setOf type2 enum	MAY	MAY
sides	type2 keyword	MAY	MAY
media	type3 keyword name(MAX)	MAY	MAY

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

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
output-documents	rangeOfInteger(MAX)	MUST	MUST

<u>Attribute name</u>	<u>syntax</u>	<u>In request</u>	<u>Printer Support</u>
document-copies	rangeOfInteger(MAX)	MAY	MAY
finishings	1setOf type2 enum	MAY	MAY
sides	type2 keyword	MAY	MAY
media	type3 keyword name(MAX)	MAY	MAY

727 The following sections describe each attribute in the above table.

728 **5.1.1 input-documents (rangeOfInteger (1:MAX))**

729 This attribute identifies one or more Input-Documents by specifying a range of numbers (see section
730 4.1 for the rules on associating a number with each Input-Documents). The Document-Exceptions
731 apply to the identified Input-Documents.

732
733 A Printer MUST support this attribute. A client MUST supply this attribute in each ‘collection’
734 value and it MUST be the first attribute of each ‘collection’ value. If this attribute is present, then
735 the client MUST NOT supply “output-documents”.

736
737 When a client supplies this attribute in a “document-exceptions” attribute of a Send-Document or
738 Send-URI request, this attribute MUST NOT identify Input-Documents which were sent in an
739 earlier operation. If a Printer receives such a value in a ‘collection’ value, it MUST treat all
740 attribute values in such a ‘collection’ value, but not other sibling ‘collection’ values, as unsupported
741 values and return the entire collection value in the Unsupported Attributes group.

742
743 See section 5 for details of usage of this attribute.

744

745 **5.1.2 output-documents (rangeOfInteger (1:MAX))**

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

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

752
753 When a client supplies this attribute in a “document-exceptions” attribute of a Send-Document or
754 Send-URI request, this attribute MUST NOT identify Output-Documents whose first Input-Page
755 was sent in an earlier operation. If a Printer receives such a value in a ‘collection’ value, it MUST
756 treat all attribute values in such a ‘collection’ value, but not other sibling ‘collection’ values, as
757 unsupported values and return the entire collection value in the Unsupported Attributes group.

758 5.1.3 document-copies (rangeOfInteger (1:MAX))

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

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

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

769 5.1.4 document-format (mimeMediaType)

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

773 5.1.5 document-name (name (MAX))

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

777 5.1.6 compression (type3 keyword)

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

781 5.1.7 document-natural-language (naturalLanguage)

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

785 5.1.8 page-ranges (1setOf rangeOfInteger (1:MAX))

786 This attribute has the same meaning as in IPP/1.1. It redefines each Input-Document to contain only
787 the specified Input-Pages. See section 5.2.3 for how this attribute interacts with “pages”.. The
788 “multiple-document-handling” attribute affects the algorithm for numbering Input-Pages when this
789 attribute is a Job attribute but when it is a Document-Exception attribute. When this attribute is a
790 Document-Exception attribute, the values of the “page-ranges” attribute specify the Input-Pages to
791 select from each of the identified Input-Documents separately, For example, if this attribute has the
792 value “3:5” and is associated with two Input-Documents A and B, Input-Document A redefined to

793 contain just two pages: 3 and 5, and Input-Document B also contains just pages 3 and 5. The Printer
794 MAY support this attribute. A client OPTIONALLY supplies it.

795
796 See section 5.2.4 for details of how this attribute affects number of pages with the “pages” attribute.

797 **5.1.9 finishings (1setOf type2 enum)**

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

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

805 **5.1.9.1 Common Behavior for Output-Document Attributes**

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

809
810 If the “document-copies” attribute is present, the attribute affects only the specified copies of the
811 Output-Documents.

812 **5.1.10 sides (type2 keyword)**

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

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

819 **5.1.10.1 Common Behavior for Sheet Attributes**

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

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

825 Because this attribute affects a Sheet, but is effectively associated with an Output-Page, a Sheet that
826 contains two or more Output-Pages may have conflicting values of this attribute. This observation

827 leads to two rules, one for the first Output-Page that this attribute is effectively associated with and
828 one for the last Output-Page that this attribute is effectively associated with.

829 a) For the first Output-Page: if the value of this attribute is effectively associated with Output-
830 Page i, and if Output-Page i is not the first Output-Page contained on a Sheet and if the value
831 of this attribute differs from the value of this attribute for the preceding Output-Page i-1,
832 then Output-Page i MUST start a new Sheet and the Printer MUST issue a warning by
833 adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing the value of the
834 “job-warnings-count” Job Description attribute by 1.

835 b) For the last Output-Page: if the value of this attribute is effectively associated with Output-
836 Page i, and if Output-Page i is not the last Output-Page contained on a Sheet and if the value
837 of this attribute differs from the value of this attribute for the following Output-Page i+1,
838 then Output-Page i+1 MUST start a new Sheet and the Printer MUST issue a warning by
839 adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing the value of the
840 “job-warnings-count” Job Description attribute by 1.

841 **5.1.11 media (type3 keyword | name(MAX))**

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

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

848 **5.1.12 Handling of Error conditions**

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

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

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

858 **5.1.13 Why not “document-exceptions-default”**

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

861 If there were a “document-exceptions-default” and it contained a “sides” and “media” exception for
862 the first Output-Page, and if a client submitted a Job with no “sides” attribute and with “media” as a
863 Job attribute with no exceptions, a possible meaning is that the Printer uses the client’s requested
864 media for the entire Job and the sides specified by the “sides-default” and the “sides” value in
865 “document-exceptions-default”. So in this example, the Printer ignores the “document-exceptions-
866 default” attribute for “media”, but uses it for “sides” because the Printer uses it for an attribute
867 “xxx” only when it uses “xxx-default”.

868 **5.1.14 document-exceptions-supported (1setOf type1 keyword)**

869 This attribute specifies the supported values of the “document-exceptions” attribute. A client can
870 use this attribute to determine what Document-Exceptions attributes the Printer supports.

871 This attribute contains the name of each attribute that the Printer supports in a ‘collection’ value of
872 the “document-exceptions” attribute. This attribute **MUST** contain the keywords “input-
873 documents” and “output-documents” because a Printer **MUST** support these attributes. This
874 attribute **MUST** also contain the name of each attribute that can be a document-exception. For
875 example, this attribute contains the keyword “sides” if and only if the Printer supports “sides” in a
876 ‘collection’ value of the “document-exceptions” attribute.

877 Standard keyword values are:

- 878 - 'none': no attributes are supported in the “document-exceptions” attribute
- 879 - 'input-documents': the “input-document” attribute is supported
- 880 - 'output-documents': the “output-document” attribute is supported
- 881 - 'document-copies': the “document-copies” attribute is supported
- 882 - 'document-format': The "document-format" attribute is supported
- 883 - 'document-name': The "document-name" attribute is supported
- 884 - 'compression': The "compression" attribute is supported
- 885 - 'document-natural-language': The "document-natural-language" attribute is supported
- 886 - 'page-ranges': The "page-ranges" attribute is supported
- 887 - 'finishings': The "finishing" attribute is supported
- 888 - 'sides': The "sides" attribute is supported
- 889 - 'media': The "media" attribute is supported
- 890 - 'media': The "media" attribute is supported

891 **5.2 page-exceptions (1setOf collection)**

892 This OPTIONAL Job Template attribute contains attributes that are associated with Input-Pages and
893 Output-Pages and that are treated as page exceptions. Such attributes are called “Page-Exceptions”
894 attributes. The remainder of this section describes features that an implementation MUST support or MAY
895 support if an implementation supports this attribute

896
897 If this attribute is not present in a Job, there are no Page-Exceptions attributes within the Job. If it is present,
898 the value consists of one or more ‘collection’ values, where each ‘collection’ value identifies one or more
899 Input-Pages or Output-Pages and contains one or more Job Template attributes which act as exceptions to
900 the corresponding Job Template attributes for the specified Input-Pages or Output-Pages.

901 The first attribute of each ‘collection’ value MUST be either “input-documents” or “output-documents”.

902
903 The second attribute MAY be “document-copies”. If present, this attributes identifies the copies of the
904 Output-Documents. If this attribute is not present in a ‘collection’ value, then the ‘collection’ value applies
905 to all Output-Documents-Copies.

906
907 If “document-copies” is present, the “pages” attribute MUST be the third attribute; otherwise, it MUST be
908 the second attribute. The “pages” attribute identifies either

- 909 - the Input-Pages relative to the Input-Document specified by “input-documents” or
- 910 - the Output-Pages relative to the Output-Document specified by “output-documents”.

911
912 The Page-Exceptions attributes applies to the identified Input-Pages or Output-Pages, which need not be
913 contiguous.

914
915 The remaining attributes in the ‘collection’ value are the Job Template attributes that are exceptions for the
916 specified Input-Pages or Output-Pages.

917
918 There may be more than one way for a client to arrange Page-Exception attributes in ‘collection’ values.
919 For example, if an Output-Document contains 10 Output-Pages to be printed 1-sided on white letter paper
920 and Output-Page 1 is to be two sided with blue letter paper and Document 2 is to be two sided with white
921 letter paper, there are two possible ways to group the exceptions. The client could specify the two
922 exceptions for Output-Page 1 in one ‘collection’ value and the single exception for Output-Page 2 in second
923 ‘collection’ values, or it could specify “two-sided” for Output-Pages 1 and 2 in one ‘collection’ value and
924 “blue letter paper” for Output-Document 1 in another ‘collection’ value.

925 If the “pages”, “document-copies” and the “input-documents” or “output-documents” identify Input-Pages,
926 Output-Pages that either don’t exist or are within nonexistent Output-Document-Copies, Input-Documents
927 or Output-Documents, the Printer silently ignores them and associates the Page-Exceptions with those
928 Input-Pages or Output-Pages that do exist. A client MUST not allow two ‘collection’ values to be
929 associated with the same Input-Page or Output-Page and to contain the same Page-Exception attribute with
930 different values. If there is such a conflict, the Printer can use either value, and it MUST issue a warning. It
931 does so by adding ‘job-warnings-detected’ to the “job-state-reasons” and by increasing the value of the

932 “job-warnings-count” Job Description attribute by 1. If the Printer detects this conflict while it is
933 processing a Job-Submission operation, it MUST return the ignored value in the Unsupported attributes.

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

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

939 For the first form, the client MUST supply “input-documents” as the first attribute. If the client supplies the
940 “document-copies” attribute, it MUST be the second attribute. The “pages” attribute MUST be the next
941 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>
input-documents	rangeOfInteger(MAX)	MUST	MUST
document-copies	rangeOfInteger(MAX)	MAY	MAY
pages	rangeOfInteger(MAX)	MUST	MUST
sides	type2 keyword	MAY	MAY
media	type3 keyword name(MAX)	MAY	MAY

942 For the second form, the client MUST supply “output-documents” as the first attribute. If the client supplies
943 the “document-copies” attribute, it MUST be the second attribute. The the “pages” attribute MUST be the
944 next 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	rangeOfInteger(MAX)	MUST	MUST
document-copies	rangeOfInteger(MAX)	MAY	MAY
pages	rangeOfInteger(MAX)	MUST	MUST
sides	type2 keyword	MAY	MAY
media	type3 keyword name(MAX)	MAY	MAY

945 The following sections describe each attribute in the above table.

946 **5.2.1 input-documents (rangeOfInteger (1:MAX))**

947 See section 5.1.1 for details of this attribute.

948 **5.2.2 output-documents (rangeOfInteger (1:MAX))**

949 See section 5.1.2 for details of this attribute.

950 **5.2.3 document-copies (rangeOfInteger (1:MAX))**

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

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

958 **5.2.4 pages (1setOf rangeOfInteger(1:MAX))**

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

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

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

973
974 When a client supplies this attribute in a Send-Document or Send-URI request, this attribute MUST
975 NOT identify Output-Pages sent in an earlier operation. If a Printer receives such a value in a
976 ‘collection’ value, it MUST treat all such values, but not other sibling ‘collection’ values, as
977 unsupported values.

978
979 See section 5 for details of usage of this attribute.

980 **5.2.5 sides (type2 keyword)**

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

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

987 **5.2.6 media (type3 keyword | name(MAX))**

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

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

994 **5.2.7 Handling of Error conditions**

995 See section 5.1.12.

996 **5.2.8 Why not “page-exceptions-default”**

997 There is no “page-exceptions-default”. See section 5.1.12 for the reasons.

998 **5.2.9 page-exceptions-supported (1setOf type1 keyword)**

999 This attribute specifies the supported values of the “page-exceptions” attribute. A client can use this
1000 attribute to determine what exception attributes the Printer supports.

1001 This attribute contains the name of each attribute that the Printer supports in a ‘collection’ value of
1002 the “page-exceptions” attribute. This attribute MUST contain the keywords “input-documents”,
1003 “output-documents” and “pages” because a Printer MUST support these attributes. This attribute
1004 MUST also contain the name of each attribute that can be a page-exception. For example, this
1005 attribute contains the keyword “sides” if and only if the Printer supports “sides” in a ‘collection’
1006 value of the “page-exceptions” attribute.

1007 Standard keyword values are:

- 1008 - 'none': no attributes are supported in the “page-exceptions” attribute
- 1009 - 'input-documents': the “input-document” attribute is supported
- 1010 - 'output-documents': the “output-document” attribute is supported
- 1011 - 'document-copies': the “document-copies” attribute is supported
- 1012 - 'pages': The "pages " attribute is supported
- 1013 - 'sides': The "sides" attribute is supported
- 1014

1015 - 'media': The "media" attribute is supported

1016 **5.3 pages-per-subset (1setOf integer)**

1017 A client **OPTIONALLY** supplies this attribute, and a Printer **OPTIONALLY** supports this attribute.
1018 If a Printer supports the Page-Subset Document Case, it **MUST** support this attribute.

1019
1020 When this attribute is present, it effectively partitions one or more Input-Documents into
1021 contiguous subsets of Input-Pages. Each subset is defined to be an Output-Document

1022
1023 The value of the attribute is a set of one or more integers, where each integer specifies the number
1024 of Input-Pages in a subset, and the set is treated as a repeating sequence of integers. Thus, when the
1025 attribute contains a single integer, the integer specifies the number of Input-Pages in each subset, as
1026 a repeating sequence of the single integer. When the number of integers in this attribute exceeds 1,
1027 the first integer specifies the number of Input-Pages in the first subset, the second integer specifies
1028 the number of Input-Pages in the second subset and so on. If numbers in this attribute are exhausted
1029 before partitioning all of the Input-Pages, the Printer starts at the beginning of the sequence again
1030 and continues until all Input-Pages are partitioned.

1031
1032 If the job contains more than one Input-Document, the Input-Pages are treated as a single stream of
1033 Input-Pages which are partitioned into contiguous subsets with some subsets possibly belonging to
1034 more than one Input-Document.

1035
1036 If the number of Input-Pages available for the last subset is less than the number specified by this
1037 attribute, the Printer **MUST** treat the last subset as an Output-Document and **MUST** issue a warning
1038 by adding 'job-warnings-detected' to the "job-state-reasons" and by increasing the value of the
1039 "job-warnings-count" Job Description attribute by 1.

1040 **5.3.1 Why not "pages-per-subset-default"**

1041 There is no "pages-per-subset-default" because there is no mechanism for a client to specify that
1042 there are no Input-Page subsets except to omit this attribute, which would cause the Printer to use
1043 the "pages-per-subset-default" attribute and create the default subsets. Without this attribute, a
1044 client can achieve subsets only by including the "pages-per-subset" attribute in the Job and the
1045 default is no subsetting. Also, if there were a defaulting mechanism, it isn't clear that customers
1046 would use the same partitioning over and over..

1047 **5.3.2 pages-per-subset-supported (Boolean)**

1048 This attribute specifies whether the Printer supports the Page-Subset Document Case. If the
1049 attribute is present and has a value of "true", the Printer supports the Page-Subset Document Case.
1050 Otherwise, the Printer doesn't support the Page-Subset Document Case

1051 **6. New Job Description attributes**

1052 **6.1.1 job-warnings-count (integer)**

1053 This OPTIONAL attribute specifies the total number of warnings that a Printer has generated while
1054 processing and printing the Job. At the beginning of a Job, the value MUST be 0. It MUST increase
1055 by 1, each time the Printer generates a warning.

1056 **7. New Job Description Values**

1057 **7.1.1 job-warnings-detected value for job-state-reasons (1setOf type2 keyword)**

1058 If the Printer supports the value 'job-warnings-detected', the Printer MUST add it to "job-state-
1059 reasons" when it generates the first warning message. That is, a single occurrence of this value is
1060 present in the "job-state-reasons" if the Printer has generated one or more warnings.

1061 **8. Extended Role of Some Operation Attributes**

1062 In IPP/1.1, the following attributes are operation attributes in all Job-Submission operations except Create-
1063 Job, but the Printer doesn't put their values into the Job object.

- 1064
- 1065 - document-format
- 1066 - document-name
- 1067 - compression
- 1068 - document-natural-language

1069
1070 With the Exception Extension, these attributes also become:

- 1071
- 1072 - Operation attributes in the Create-Job and Validate-Job operation when all or most Input-
1073 Documents have the same attribute value.
- 1074 - Job Template attributes, so their values are accessible to a client via the Get-Job-Attributes and Get-
1075 Jobs operation.
- 1076 - Job Description attributes, for legacy reasons so their values are accessible to a client via the Get-
1077 Job-Attributes and Get-Jobs operation via the Job Description group name.

1078 - Document-Exceptions attributes, so the values are associated with one Input-Document (possible in
1079 IPP/1.1) and a client can query the attributes via Get-Job-Attributes and Get-Jobs operation (not
1080 possible in IPP/1.1).

1081 If a Printer supports the Exception Extension and if it supports an attribute in this section, it MUST support
1082 the attribute in the three contexts above. In IPP/1.1, a Printer MUST support all attributes in this section
1083 except the “document-natural-language” attribute. This effectively means that if a Printer supports this
1084 extension, it MUST support all of the attributes in this section except “document-natural-language” in the
1085 three contexts described above.

1086
1087 When one of the attributes in this section is an operation attribute in Print-Job, Print-URI or Create-Job, it
1088 becomes a Job Template attribute in the newly created Job object. If one of these attributes is a Document-
1089 Exceptions attribute, that attribute overrides the Job level attribute for the specified Input-Document.

1090
1091 When one of the attributes in this section is an operation attribute in Validate-Job, it is validated as if it
1092 were an operation attribute of Create-Job.

1093
1094 When one or more of the attributes in this section is an operation attribute in Send-Document or Send-URI
1095 request, they are put into a ‘collection’ value that is added to the “document-exceptions” attribute. See
1096 section 5.1 for a discussion of possible conflicts.

1097 **9. Extensions to Printer Operations**

1098 The sections below specify the extensions to the groups within IPP 1.1 operations. If an operation or a
1099 group within an operation is not mentioned, this extension does not change that operation or group,
1100 respectively.

1101

1102 **9.1 Create-Job and Validate-Job Operation Requests**

1103 Attributes are added to the operation attributes group.

1104

1105 Group 1: Operation Attributes

1106

1107 Add the attributes specified in section 6: “document-format”, “document-name”,
1108 “compression” and “document-natural-language”, so that a client can specify these
1109 attributes, at the job level.

1110 **9.2 Send-Document and Send-URI Operation Requests**

1111 Attributes are added to the Operation Attributes group.

1112

1113 Group 1: Operation Attributes

1114

1115 "input-document-number" (integer):

1116
1117 The client **OPTIONALLY** supplies this attribute in order to inform the printer about the
1118 order of documents when the printer is sending the Input-Documents asynchronously.
1119 The first Input-Document is 1, and subsequent Input-Documents are numbered
1120 sequentially. If the value of "last-document" is 'true', then the value of this attribute is
1121 also the total number of Input-Documents in the Job. If a client supplies this attribute in
1122 one Send-Document or Send-URI operation in a Job, it **MUST** send it in all such
1123 operations. A Printer deals with missing Input-Documents in the same way as without
1124 this attribute except that a time-out can occur with Input-Documents anywhere in the
1125 Job. For example, a Printer could receive Input-Documents 1 and 3 and not 2.

1126
1127 "document-exceptions" (1setOf collection):

1128
1129 The client **OPTIONALLY** supplies this attribute. See section 5.1 for details. The Printer
1130 **MUST** support this attribute if it supports the "document-exceptions" Job Template
1131 attribute. If the job doesn't contain a "document-exceptions" attribute, this attribute is
1132 added to the Job. Otherwise, the 'collection' values from this attribute are appended to
1133 the existing "document-exceptions" attribute. See section 5.1 for rules of resolving
1134 conflicts. Also the "input-documents" attribute is added to any 'collection' value that
1135 contains neither an "input-documents" nor "output-documents" attribute.

1136
1137 "page-exceptions" (1setOf collection):

1138
1139 The client **OPTIONALLY** supplies this attribute. See section 5.2 for details. The Printer
1140 **MUST** support this attribute if it supports the "page-exceptions" Job Template attribute.
1141 If the job doesn't contain a "page-exceptions" attribute, this attribute is added to the Job.
1142 Otherwise, the 'collection' values from this attribute are appended to the existing "page-
1143 exceptions" attribute. See section 5.2 for rules of resolving conflicts. Also the "input-
1144 documents" attribute is added to any 'collection' value that contains neither an "input-
1145 documents" nor "output-documents" attribute.

1146 **10. Examples**

1147 This section currently contains 3 examples for various relationships of Input-Documents and Output-
1148 Documents.. The first example is for the Degenerate Case only. The second and third cases are for the
1149 Separate-Document Case, the Single-Documents Case and the Page-Subset Documents Case.

1150
1151 Brackets are used to delimit the beginning and end of each Collection value.

1152 **10.1 First Page of Single Document is Letterhead**

1153 In the first example, the Printer produces 1 copy of a single Output-Document. It is printed on letter-
1154 paper using Print-Job. The first Output-Page of the Output-Document is letterhead paper.

1155

1156 **10.1.1 Degenerate Case.**

1157 There is one Input-Document A which produces one Output-Document.

1158

1159 Print-Job

1160 job attributes group

1161 media: letter

1162 page-exceptions: {

1163 output-documents: 1:1 (I could have used input-documents: 1:1 as well)

1164 pages: 1:1

1165 media: letterhead }

1166 end-of-attributes

1167 Input-Document A

1168

1169 **10.2 First Page of Several Documents is Blue**

1170 In the second example, the Printer produces 3 copies of each Output-Document. Each is stapled and
 1171 printed on letter-paper, two-sided using Create-Job. The first Output-Page of each Output-Document is
 1172 blue-letter paper and one-sided. All Input-Documents are PostScript.

1173

1174 Attributes that differ between cases are in bold. The values for the attribute “input-documents” changes
 1175 with each example, but could be “1:100” for all.

1176 **10.2.1 Separate-Documents Case.**

1177 There are two Input-Documents A and B which produce two Output-Documents.

1178

1179 Create-Job

1180 operations attributes group

1181 document-format: application/PostScript

1182 job attributes group

1183 * **multiple-document-handling: separate-documents-collated-copies**

1184 sides: two-sided-long-edge

1185 media: letter

1186 copies: 3

1187 finishings: stapling

1188 page-exceptions: {

1189 output-documents: 1:2 (I could have used input-documents: 1:2 as well)

1190 pages: 1:1

1191 sides: one-sided

1192 media: blue-letter }

1193 end-of-attributes

1194 Send-Document

1195 end-of-attributes

1196 Input-Document A

1197 Send-Document

1198 end-of-attributes

1199 Input-Document B

1200

1201 **10.2.2 Single-Documents Case**

1202 There are two Input-Documents A and B and only one Output-Document.

1203

1204 Create-Job

1205 operations attributes group

1206 document-format: application/PostScript

1207 job attributes group

1208 **multiple-document-handling: single-document**

1209 sides: two-sided-long-edge

1210 media: letter

1211 copies: 3

1212 finishings: stapling

1213 page-exceptions: {

1214 output-documents: 1:1 (I could have used input-documents: 1:1)

1215 pages: 1:1

1216 sides: one-sided

1217 media: blue-letter }

1218 end-of-attributes

1219 Send-Document

1220 end-of-attributes

1221 Input-Document A

1222 Send-Document

1223 end-of-attributes

1224 Input-Document B

1225

1226 **10.2.3 Page-Subset Documents Case**

1227 There are two Input-Documents A and B. . The first Input-Document contains 10 Pages and the second
 1228 one 15 pages. There are 7 Output-Documents with 3 pages, 5 pages, 4 pages, 2 pages, 3 pages, 5 pages
 1229 and 3 pages. The “ pages-per-subset” attributes wraps after the first four Output-Documents and starts
 1230 with “3” again. After consuming 22 Input-Pages, the next number is “4”, but only 3 pages remain. So
 1231 the last Output-Document is short. These value show two boundary cases.

1232

1233 Create-Job

1234 operations attributes group

1235 document-format: application/PostScript

1236 job attributes group

1237 **multiple-document-handling: separate-documents-collated-copies**1238 **pages-per-subset: 3, 5, 4, 2**

1239 sides: two-sided-long-edge

1240 media: letter

1241 copies: 3

1242 finishings: stapling

1243 page-exceptions: {

1244 output-documents: 1:7 (I could have used output-documents: 1:100 to be safe)

1245 pages: 1:1

1246 sides: one-sided

1247 media: blue-letter }

1248 end-of-attributes

1249 Send-Document
 1250 end-of-attributes
 1251 Input-Document A
 1252 Send-Document
 1253 end-of-attributes
 1254 Input-Document B

1255 10.3 First Page is Blue and First Document is not stapled

1256 In the third example, the Printer produces 3 copies of each Output-Document. Each is stapled and
 1257 printed on letter-paper, two-sided using Create-Job. The third and fourth Output-Pages of each Output-
 1258 Document is blue-letter paper and one-sided. The second Output-Document is not stapled. All files are
 1259 PostScript except the second which is html.

1261 Attributes that differ between cases are in bold. The values for the attribute “input-documents” changes
 1262 with each example, but could be “1:100” for all.

1263 10.3.1 Separate-Documents Case

1264 There are two Input-Documents A and B which produce two Output-Documents.

1265
 1266 There are three version presented here in order to show three different places to put the attributes
 1267 associated with an Input-Document. The differences are in *bold-italic*.

1268
 1269 First solution:

1270
 1271 Create-Job
 1272 operations attributes group
 1273 document-format: application/PostScript
 1274 job attributes group
 1275 **multiple-document-handling: separate-documents-collated-copies**
 1276 sides: two-sided-long-edge
 1277 media: letter
 1278 copies: 3
 1279 finishings: stapling
 1280 document-format: application/PostScript
 1281 document-exceptions: {
 1282 output-documents: 2:2 (I could have used input-documents: 2:2 & merged with next)
 1283 finishings: none }
 1284 {
 1285 **input-documents: 2:2** *next value of multi-value*
 1286 **document-format: text/html**
 1287 page-exceptions: {
 1288 output-documents: 1:2 (I could have used input-documents: 1:2 as well)
 1289 pages: 3:4
 1290 sides: one-sided
 1291 media: blue-letter }
 1292 end-of-attributes
 1293 Send-Document
 1294 end-of-attributes
 1295 Input-Document A

1296 Send-Document
 1297 end-of-attributes
 1298 Input-Document B
 1299
 1300 Second solution:
 1301
 1302 Create-Job
 1303 operations attributes group
 1304 document-format: application/PostScript
 1305 job attributes group
 1306 **multiple-document-handling: separate-documents-collated-copies**
 1307 sides: two-sided-long-edge
 1308 media: letter
 1309 copies: 3
 1310 finishings: stapling
 1311 document-format: application/PostScript
 1312 document-exceptions: {
 1313 output-documents: 2:2
 1314 finishings: none }
 1315 page-exceptions: {
 1316 output-documents: 1:2 (I could have used input-documents: 1:2 as well)
 1317 pages: 3:4
 1318 sides: one-sided
 1319 media: blue-letter }
 1320 end-of-attributes
 1321 Send-Document
 1322 end-of-attributes
 1323 Input-Document A
 1324 Send-Document
 1325 *Operation attributes group*
 1326 *document-format: text/html*
 1327 end-of-attributes
 1328 Input-Document B
 1329
 1330 Third solution:
 1331
 1332 Create-Job
 1333 operations attributes group
 1334 document-format: application/PostScript
 1335 job attributes group
 1336 **multiple-document-handling: separate-documents-collated-copies**
 1337 sides: two-sided-long-edge
 1338 media: letter
 1339 copies: 3
 1340 finishings: stapling
 1341 document-format: application/PostScript
 1342 page-exceptions: {
 1343 output-documents: 1:2 (I could have used input-documents: 1:2 as well)
 1344 pages: 3:4
 1345 sides: one-sided
 1346 media: blue-letter }
 1347 end-of-attributes
 1348 Send-Document

1349 end-of-attributes
 1350 Input-Document A
 1351 Send-Document
 1352 **Operation attributes group**
 1353 **document-exceptions: {**
 1354 **input-documents: 2:2**
 1355 **document-format: text/html**
 1356 **finishings: none }**
 1357 end-of-attributes
 1358 Input-Document B
 1359

1360 10.3.2 Single-Documents Case

1361 There are two Input-Documents A and B and only one Output-Document.

1362
 1363 There are three solutions. The Page-Exception attributes are in Create-Job in the first solution and in
 1364 Send-Document in the last two solutions. The Document-Exception attribute is directly in the operation
 1365 attributes of Send-Document in the first two solutions and in the document-exceptions attributes of
 1366 Send-Document in the third solution. The differences are in *bold-italic*.

1367

1368 First solution:

1369

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-exceptions: {
 1380 output-documents: 2:2 (This is ignored because there is no 2nd document)
 1381 finishings: none }
 1382 **page-exceptions: {**
 1383 **input-documents: 1:1** (*I could have used output-documents: 1:1*)
 1384 **pages: 3:4**
 1385 **sides: one-sided**
 1386 **media: blue-letter }**

1387 end-of-attributes

1388 Send-Document

1389 end-of-attributes

1390 Input-Document A

1391 Send-Document

1392 Operation attributes group

1393 **document-format: text/html**

1394 end-of-attributes

1395 Input-Document B

1396

1397 Second solution:

1398

1399 Create-Job
 1400 operations attributes group
 1401 document-format: application/PostScript
 1402 job attributes group
 1403 **multiple-document-handling: single-document**
 1404 sides: two-sided-long-edge
 1405 media: letter
 1406 copies: 3
 1407 finishings: stapling
 1408 document-exceptions: {
 1409 output-documents: 2:2 (This is ignored because there is no 2nd document)
 1410 finishings: none }
 1411 end-of-attributes
 1412 Send-Document
 1413 Operation attributes group
 1414 **page-exceptions: {**
 1415 **input-documents: 1:1** (I could have used output-documents: 1:1)
 1416 **pages: 3:4**
 1417 **sides: one-sided**
 1418 **media: blue-letter }**
 1419 end-of-attributes
 1420 Input-Document A
 1421 Send-Document
 1422 Operation attributes group
 1423 **document-format: text/html** (this can be here or in the document-exceptions)
 1424 end-of-attributes
 1425 Input-Document B
 1426

1427 Third solution:

1428
 1429 Create-Job
 1430 operations attributes group
 1431 document-format: application/PostScript
 1432 job attributes group
 1433 **multiple-document-handling: single-document**
 1434 sides: two-sided-long-edge
 1435 media: letter
 1436 copies: 3
 1437 finishings: stapling
 1438 document-exceptions: {
 1439 output-documents: 2:2 (This is ignored because there is no 2nd document)
 1440 finishings: none }
 1441 end-of-attributes
 1442 Send-Document
 1443 Operation attributes group
 1444 **page-exceptions: {**
 1445 **input-documents: 1:1** (I could have used output-documents: 1:1)
 1446 **pages: 3:4**
 1447 **sides: one-sided**
 1448 **media: blue-letter }**
 1449 end-of-attributes
 1450 Input-Document A
 1451 Send-Document
 1452 Operation attributes group

1453 *document-exceptions: {*
 1454 *input-documents: 2:2*
 1455 *document-format: text/html }*
 1456 end-of-attributes
 1457 Input-Document B

1458 **10.3.3 Page-Subset Documents Case**

1459 There are two Input-Documents A and B. . The first Input-Document contains 10 Pages and the second
 1460 one 15 pages. There are 7 Output-Documents with 3 pages, 5 pages, 4 pages, 2 pages, 3 pages, 5 pages
 1461 and 3 pages. The “pages-per-subset” attributes wraps after the first four Output-Documents and starts
 1462 with “3” again. After consuming 22 Input-Pages, the next number is “4”, but only 3 pages remain. So
 1463 the last Output-Document is short.

1464
 1465 Create-Job
 1466 operations attributes group
 1467 document-format: application/PostScript
 1468 job attributes group
 1469 **multiple-document-handling: separate-documents-collated-copies**
 1470 **pages-per-subset: 3, 5, 4, 2**
 1471 sides: two-sided-long-edge
 1472 media: letter
 1473 copies: 3
 1474 finishings: stapling
 1475 document-exceptions: {
 1476 output-documents: 2:2
 1477 finishings: none }
 1478 page-exceptions: {
 1479 output-documents: 1:7 (I could have used input-documents: 1:100 to be safe)
 1480 pages: 3:4
 1481 sides: one-sided
 1482 media: blue-letter }
 1483 end-of-attributes
 1484 Send-Document
 1485 end-of-attributes
 1486 Input-Document A
 1487 Send-Document
 1488 Operation attributes group
 1489 document-format: text/html (this can be here or in the document-exceptions)
 1490 end-of-attributes
 1491 Input-Document B
 1492

1493 **10.4 One document with 100 copies for distribution and one on transparencies.**

1494 In the fourth example, the Printer produces 101 copies of the single Output-Document using Print-Job.
 1495 The first 100 are stapled and printed on letter-paper, two-sided, except the first page is on blue paper,
 1496 one-sided. The eleventh copy is printed on transparencies, one-sided and not stapled. The file is
 1497 PostScript.

1498
 1499 Print-Job
 1500 operations attributes group

1501 document-format: application/PostScript
 1502 job attributes group
 1503 sides: two-sided-long-edge
 1504 media: letter
 1505 copies: 101
 1506 finishings: stapling
 1507 document-format: application/PostScript
 1508 document-exceptions: {
 1509 output-documents: 1:1 (I could have used input-documents: 1:1 as well)
 1510 document-copies: 101:101
 1511 sides: one-sided
 1512 media: transparency }
 1513 finishings: none }
 1514 page-exceptions: {
 1515 output-documents: 1:1 (I could have used input-documents: 1:1 as well)
 1516 document-copies: 1:100
 1517 pages: 1:1
 1518 sides: one-sided
 1519 media: blue-letter }
 1520 end-of-attributes
 1521 Input-Document A
 1522

1523 11. IANA Considerations

1524
 1525 IANA will be called on to register the Job Template attributes defined in this document, using the
 1526 procedures outlined in [ipp-mod].

1527 12. Internationalization Considerations

1528 The IPP extensions defined in this document require the same internationalization considerations as any of
 1529 the Job Template attributes defined in IPP/1.1 [ipp-mod].

1530 13. Security Considerations

1531 The IPP extensions defined in this document require the same security considerations as any of the Job
 1532 Template attributes defined in IPP/1.1 [ipp-mod].

1533 14. References

1534 [ipp-mod]
 1535 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.0: Model and
 1536 Semantics", <draft-ietf-ipp-model-v11-04.txt>, June 23, 1999.

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[RFC2566]

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

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15. Author's Addresses

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16. Appendix A: Rules for Attribute Association

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For each category of attribute, there is a rule:

1. Input-Documents: such an attribute
 - a) cannot be directly associated with Input-Pages, Output-Pages, Output-Documents
 - b) can be directly associated with an Input-Document, and it affects the Input-Document it is associated with.
 - c) can be associated with a Job and it affects all Input-Documents that don't have the attribute associated with it.
2. Output-Documents: such an attribute
 - a) can never be directly associated with an Input-Page or Output-Page.
 - b) can be directly associated with an Output-Document, and it affects the Output-Document it is associated with.
 - c) can be directly associated with an Input-Document. If that Input-Document produces a first Output-Page for one or more Output-Documents, the attribute is effectively associated with each such Output-Document that doesn't have the attribute directly associated with it. Now use rule 2b). If that Input-Document doesn't produce any first Output-Pages of an Output-Document, it is ignored and the Printer produces a warning message.

- 1574 d) can be associated with a Job and it affects all Output-Documents that don't have the attribute
1575 associated with it.
- 1576 3. Sheets: such attributes
- 1577 a) can be directly associated with an Output-Page, and it affects the associated Output-Page .
- 1578 b) can be directly associated with an Input-Page, and it is effectively associated with the Output-
1579 Page determined by the relationship described for the four cases in section 4.2 if that Output-
1580 Page doesn't have the attribute directly associated with it. Now use rule 3a)
- 1581 c) can be directly associated with an Output-Document, and it affects all Output-Pages in the
1582 specified Output-Document that don't have the attribute associated directly with it or the
1583 corresponding Input-Page.
- 1584 d) can be directly associated with an Input-Document, and it is effectively associated with all Input-
1585 Pages in the specified Input-Document that don't have the attribute associated directly with it.
1586 By transitivity, the attribute is effectively associated with all corresponding Output-Pages (see
1587 section 4.2) that don't have the attribute associated directly with the them or the containing
1588 Output-Document. Now use rule 3a)
- 1589 e) can be associated with a Job and it affects all Output-Pages that don't have the attribute
1590 associated with it.
- 1591

1592 When an association includes the "document-copies" attribute, it modifies the meaning of the above rules
1593 slightly for each effective association. If the attribute effectively associates with:

- 1594
- 1595 - Input-Documents, the Printer ignores the "document-copies" attribute.
 - 1596 - Output-Documents, the attribute affects the specified copies of the Output-Documents (See Item
1597 2b))
 - 1598 - Sheets: the attribute affects the sheets of the specified copies of Output-Documents (See Items 3a)
1599 and 3c)).

1600 **17. Appendix B: Change History**

1601 This section summarizes the changes to the document. Each sub-section is in reverse chronological order.
1602 Adding or removing ISSUES that don't change the document are not listed here.

1603 **17.1 Changes to the January 3, 2000 version to make the January 31, 2000 version**

1604 The following changes to the January 3, 2000 version to make the January 31, 2000 version:

- 1605 1. Changed the format to be a PWG-DRAFT. No technical content changed.

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18. Appendix C: Description of the IEEE-ISTO PWG

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For additional information regarding the Printer Working Group visit:

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19. Appendix D: IEEE Industry Standards and Technology Organization Copyright Statement

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