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## 3 4 The Printer Working Group (PWG) 5 Standard for 6 The Internet Printing Protocol (IPP): 7 Document Object 8

9 **Abstract:** This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a  
10 Document object. The [rfc2911] Job object is extended to contain one or more Document objects which are passive  
11 objects operated on by the Job. A new REQUIRED Create-Document operation allows a client to supply the  
12 Document Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content  
13 for that Document object using the new REQUIRED Send-Document-Data operation.

14 This specification also defines five new operations for Document objects once they have been created:

15 1 REQUIRED Job operation: Close-Job

16 3 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes, Get-Documents

17 2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

18 This specification also lists all of the attributes defined in other IPP specifications to show their relationship to  
19 corresponding attributes defined in this IPP specification for use with the Document object.

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



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26 Working Draft, 2016 March 2003

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# The Printer Working Group (PWG)

## Standard for

### The Internet Printing Protocol (IPP):

### Document Object

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

34

35 [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_DOC/wd-ippdoc2003032014.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc2003032014.pdf), .doc, .rtf

36

37 This document is a Working Draft for an IEEE-ISTO PWG Candidate Standard. For a definition of a "PWG  
38 Candidate Standard" and its transition to a "PWG Standard", see: [ftp://ftp.pwg.org/pub/pwg/general/pwg-  
39 process.pdf](ftp://ftp.pwg.org/pub/pwg/general/pwg-process.pdf). After approval by the PWG (by a Last Call) to transition a PWG Working Draft to a PWG Candidate  
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105 end

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

111

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## 303 1 Introduction and Summary

304 This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object.  
305 The [rfc2911] Job object is extended to contain one or more Document objects which are passive objects operated  
306 on by the Job. The Job object is created by the REQUIRED<sup>1</sup> Create-Job (see [rfc2911] section 3.2.4) operation and  
307 is closed by the Close-Job operation (~~see new - defined in~~ section 4.3). The Document object is created by the  
308 REQUIRED<sup>2</sup> Send-Document (see [rfc2911] section 3.3.1) and OPTIONAL Send-URI (see [rfc2911] section 3.3.2)  
309 operations and represents an Input Document to the Job. This specification also adds a Document Attributes group  
310 (and tag) to these Send-Document and Send-URI requests. The Document Attributes group contains any Document  
311 Template attributes to be applied to this Document object being created, overriding any corresponding Job Template  
312 attribute supplied at the job level. A new REQUIRED Create-Document operation allows a client to supply the  
313 Document Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content  
314 for that Document object using the new REQUIRED Send-~~Document~~-Data operation.

315 This specification defines one new operation for Job objects and five new operations for Document objects once they  
316 have been created:

- 317 1 REQUIRED Job operation: Close-Job
- 318 3 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes, Get-Documents
- 319 2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

320 This specification also lists all of the attributes defined in other IPP specifications<sup>3</sup> to show their relationship to  
321 corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the  
322 “document-state”, “document-state-reasons”, and “document-state-message” Document Description attributes are  
323 given along side of the corresponding [rfc2911] “job-state”, “job-state-reasons”, and “job-state-message” Job  
324 Description attributes. Finally, the analogous Document Descriptions attributes that correspond to the Job  
325 Description attributes are defined.

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

330 This specification also defines “media-size-name” and “media-type” as Job Template and Document Template  
331 attributes to provide a detailed specification for reference from the PWG Semantic Model.

### 332 1.1 Scope

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

<sup>1</sup> The Create-Job operation is OPTIONAL in [rfc2911], but is REQUIRED by this specification in order to support the Document object defined in this specification.

<sup>2</sup> The Send-Document is OPTIONAL in [rfc2911], but is REQUIRED by this specification in order to support the Document object defined in this specification.

<sup>3</sup> This specification lists all attributes defined in other IPP specifications at the time of publication of this specification. No attempt will be made to keep this specification up to date after publication.

339 The Document object is a passive object<sup>4</sup> and is operated upon by the Job. The client uses the new Create-  
 340 Document operation or either of the existing Send-Document and Send-URI operations to create a Document object.  
 341 In addition there are 8 new operations that affect the Document object after it has been created as summarized in  
 342 Table 1.

343 **Table 1 - List of operations**

Operation Name	Printer support	Brief Description
Close-Job	REQUIRED	Closes the Job object that was created with Document objects.
Create-Document <sup>5</sup>	REQUIRED	Creates a Document object with Document attributes, but no data.
Send-Document-Data	REQUIRED	Sends data to the Document object created by Create-Document.
Send-Document *	REQUIRED	Creates a Document object with Document attributes and data.
Send-URI *	OPTIONAL	Creates a Document object with Document attributes and a URL reference to the data (print-by-reference).
Get-Document-Attributes	REQUIRED	Get requested attributes of specified Document in the specified Job.
Get-Documents	REQUIRED	Get requested attributes of all of the Documents in the specified Job.
Set-Document-Attributes	OPTIONAL	Set the supplied Document attributes on the specified Document.
Cancel-Document	REQUIRED	Cancel the specified Document in the specified Job, but don't remove it.
Delete-Document	OPTIONAL	Remove the specified Document object and its data from the Job.

344 \* The existing IPP/1.1 operations defined in [rfc2911] with an extension so the client can supply Document Template  
 345 attributes in a new attribute Group in the request.

346 ~~This specification also specifies the life cycle of the Document object by defining the "document-state", "document-~~  
 347 ~~state-reasons", and "document state message" attributes. Finally, the analogous Document Descriptions attributes~~  
 348 ~~that correspond to the Job Description attributes are defined.~~

## 349 2 Terminology

350 This section defines terminology used throughout this document.

### 351 2.1 Conformance Terminology

352 Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, ~~NEED NOT~~, and  
 353 **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [rfc2119] and [rfc2911] section  
 354 4.2.4. If an implementation supports the extension defined in this document, then these terms apply; otherwise, they  
 355 do not. These terms define conformance to *this document (and [rfc2911]) only*; they do not affect conformance to  
 356 other documents, unless explicitly stated otherwise. ~~For example, To be more specific:~~

357 ~~**REQUIRED**—an adjective used to indicate that a conforming IPP Printer implementation MUST support the indicated~~  
 358 ~~operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. See~~  
 359 ~~[rfc2911] "Appendix A—Terminology for a definition of "support". Since support of this entire Document Object~~  
 360 ~~specification is OPTIONAL for conformance to IPP/1.1, the use of the term REQUIRED in this document means~~  
 361 ~~"REQUIRED if this OPTIONAL Document Object specification is implemented".~~

<sup>4</sup> The Document object is *not* a sub-job. If Job trees are desired where sub-jobs can be on different network nodes, such as in JDF, then a separate specification should be generated for Job trees.

<sup>5</sup> The Create-Document operation maps to the PWG PSI Send-Document-By-Post operation and the Send-Document-Data maps to the HTTP Post operation.

362 ~~RECOMMENDED—an adjective used to indicate that a conforming IPP Printer implementation is recommended to~~  
363 ~~support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and~~  
364 ~~responses. Since support of this entire Document Object specification is OPTIONAL for conformance to IPP/1.1, the~~  
365 ~~use of the term RECOMMENDED in this document means “RECOMMENDED if this OPTIONAL Document Object~~  
366 ~~specification is implemented”.~~

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

## 370 2.2 Other Terminology

371 This document uses the same terminology as [rfc2911], such as “client”, “Printer”, “attribute”, “attribute value”,  
372 “keyword”, “Job Template attribute”, “Operation attribute”, “operation”, “request”, “response”, and “support”  
373 with the same meaning. In addition, the following terms are defined for use in this document:

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

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

380 **Document Creation operation** - operations that create Document objects. Specifically: Create-Document, Print-  
381 Job, Print-URI, Send-Document and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and  
382 **Document Creation** operations, since they create both Job and a **Document object** at the same time. Also this  
383 specification does not extend the Print-Job and Print-URI operations. However, this specification does extend the  
384 Send-Document and Send-URI operations to allow the client to supply **Document Template** attributes in each  
385 request.

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

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

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

394 **Honor** - a Printer is said to **Honor** an attribute supplied by the client, if the Printer **supports** that attribute and the  
395 supplied value and performs the indicated semantics. If the client supplies the “ipp-attribute-fidelity” or “job-  
396 mandatory-attributes” Operation attribute, the client is indicating which supplied attributes the Printer **MUST Honor**.

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

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

401 **Job Level** - attributes supplied in the Print-Job, Print-URI, and Create-Job are referred to as being supplied at the  
402 **Job Level**. Attributes supplied at the **Job Level** are a mixture of **Job attributes** and **Document attributes**. **Job**

403 **attributes** apply to the Job as a whole, while **Document attributes** provide defaults for the **Document objects** in  
 404 case the client does not supply a **Document attribute** at the **Document Level** for a **Document object**. Put another  
 405 way, **Document objects** *inherit* **Document attributes** from the **Job object** which are used if the client didn't supply  
 406 a corresponding attribute for the **Document object**.

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

411 Table 2 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job  
 412 Creation operations and Document Creation operations, though they only create single Document jobs. In other  
 413 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be  
 414 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a  
 415 separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept,  
 416 no operation supplies attributes at more than one level.<sup>6</sup>

417 **Table 2 - Job Creation and Document Creation operations**

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

418

### 419 **3 Document Operations**

420 The Document object semantics are as parallel to the Job object semantics as possible. Therefore, most of the Job  
 421 operations have analogous Document operations as shown in Table 18 in section "Appendix A: Document operations  
 422 compared to Job operations". Operations that can apply only to an entire job, have no analogous document  
 423 operation as indicated. This extension adds 8 new Document operations that operate on the Document object once

<sup>6</sup> The PWG Semantic Model [pwg-sm] calls the Operation attributes supplied by the client: Job Description attributes or Document Description attributes for the Job Creation and Document Creation operations, respectively. The [pwg-sm] also calls Job Template attributes and Document Template attributes: Job Processing and Document Processing attributes, respectively. Each Processing attribute is defined to be a Job Processing or a Document Processing attribute, but is not both. The client can supply both Job Processing and Document Processing attributes in a Job Creation operation, in which case the Document Processing attributes server as defaults for the Document objects. The Printer copies all of these client's supplied attributes to the Job or Document object. Read-only Job and Document attributes that the system sets are called Job Status and Document Status attributes (instead of Description attributes).

424 it is created by the new Create-Document operation or either of the existing two operations: Send-Document and  
 425 Send-URI operations.

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

428 The signatures of the operation requests that create and/or validate Document objects are very similar as shown in  
 429 Table 3 and defined in section 3.1 through section 3.4. The entries in the table show what a client MUST, MAY, or  
 430 MUST NOT supply in the indicated operation requests.

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

	Create-Document	Send- <del>Document</del> -Data	Send-Document	Send-URI
Target job	MUST	MUST	MUST	MUST
“document-uri”	MUST NOT	MUST NOT	MUST NOT	MUST
Document Template attributes	MAY	MUST NOT	MAY	MAY
Data	MUST NOT	MUST	MUST	MUST NOT

432

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

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

	Create-Document	Send- <del>Document</del> -Data	Send-Document	Send-URI
Status code/message	MUST	MUST	MUST	MUST
Unsupported Attributes	MUST, if any	MUST, if any	MUST, if any	MUST, if any
Job status attributes	MUST	MUST	MUST	MUST
Document status attributes:				
“document-number”	MUST	MUST	MUST	MUST
“document-id-uri”	MUST	MUST	MUST	MUST
“document-state”	MUST	MUST	MUST	MUST
“document-state-reasons	MUST	MUST	MUST	MUST
“document-state-message	MAY	MAY	MAY	MAY

436

437 **3.1 Create-Document Operation**

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

443 The client can supply multiple documents for a single Job using pairs of Create-Document and Send-~~Document~~-Data  
 444 operations. The order of the corresponding Send-~~Document~~-Data operations is not important, so that the client can  
 445 send pairs of Create-Document and Send-~~Document~~-Data operations or can send a number of Create-Document

446 operations followed by the corresponding Send-~~Document~~-Data operations<sup>7</sup>. The latter approach is useful if the  
 447 client wants to make sure that all Documents will be accepted by the Printer before sending any of the Document  
 448 data to the Printer.

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

- 450 1. MUST also support the Create-Document and Send-~~Document~~-Data operations
- 451 2. MUST support the "multiple-operation-time-out" Printer Description attribute (see [rfc2911] section 4.4.31).
- 452 3. MUST support the "multiple-document-jobs-supported" Printer Description attribute (see [rfc2911] section  
 453 4.4.16) with a 'true' value, that is the Printer MUST support multiple document jobs.
- 454 4. MUST support the "multiple-document-handling" Job Template job attribute with at least one value (see  
 455 [rfc2911] section 4.2.4) and the associated "multiple-document-handling-default" and "multiple-document-  
 456 handling-supported" Job Template Printer attributes (see [rfc2911] section 4.2).
- 457 5. MUST support the Attribute Precedence semantics specified in section 5 for the levels that the Printer  
 458 supports.

459 The Printer sets the value of the Document's "document-state" Document Description attribute to 'pending', if the  
 460 Printer accepts the Create-Document request. A Printer MAY set the 'job-data-insufficient' value of the Document's  
 461 "document-state-reason" Document Description attribute to indicate that processing cannot begin until sufficient data  
 462 has arrived and set the "document-state" to 'pending'. A non-spooling printer that doesn't implement the 'pending'  
 463 document state may even set the "document-state" to 'processing', even though there is not yet any data to process.  
 464 See sections 8.2.20 and 8.2.22.

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

### 469 3.1.1 Create-Document Request

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

#### 471 Group 1: Operation Attributes

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

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

##### 476 Target:

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

---

<sup>7</sup> The concept of an "input-document-number" operation attribute is not defined for Create-Document operations and will be deleted from the next version of the [pwg5100.4] for Send-Document and Send-Data operations. Therefore, the client must use the "document-numbers" returned by the Printer which the Printer assigns monotonically increasing from 1 for each Document in a multi-document Job. Overlapping sending data for a multi-document job, while possible, is unlikely to improve throughput, since it is the bandwidth of the network that is more likely to be the limiting factor, not the processing on the Printer.

480 **Requesting User Name:**  
 481 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in  
 482 [rfc2911] section 8.3.

483 **3.1.1.1 input-document-number (integer(1:MAX)) DEPRECATED**

484 ~~ISSUE 00: Or should we just delete "input-document-number" when we republish pwg5100.4 without~~  
 485 ~~"document-overrides?"~~

486 ~~The "input-document-number" operation attribute ([pwg5100.4] section 9.2.1) is DEPRECATED. A client~~  
 487 ~~MUST NOT supply the "input-document-number" operation attribute. Clients that want to submit multiple~~  
 488 ~~(large) document data in parallel MUST create each Document object separately in the order desired. Then~~  
 489 ~~the client MAY send the data in parallel with separate Send-Document operations (see section 3.2). If the~~  
 490 ~~client does supply the DEPRECATED "input-document-number" operation attribute, the Printer MUST ignore~~  
 491 ~~the value and assign the "document-number" Document Description attribute monotonically increasing~~  
 492 ~~starting with 1 for each job (see below).~~

493 **3.1.1.1 last-document (boolean)**

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

498 **3.1.1.2 document-message (text(MAX))**

499 The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also  
 500 support the corresponding "document-message" (text(MAX)) Document Description attribute (see section  
 501 8.2.16) and copy this value to the "document-message" Document Description attribute. The end user can  
 502 use this Document Description attribute as a message to the operator and the operator can use it as a  
 503 message to the user. The Printer MAY print this message on a document start sheet for this document, if  
 504 any.

505 **3.1.1.3 Additional Operation attributes:**

506 Any of the other Operation attributes indicated in the "Level Supplied" column labeled with a "y" in the "Doc"  
 507 column in Table 6, such as "document-name", ~~and~~ "document-format", ~~and~~ "document-format-details"  
 508 ~~attributes~~. These Operation attributes are said to be supplied at the Document Level and apply to the  
 509 Document object, overriding any Operation attributes supplied at the Job Level. For example, if "document-  
 510 format" = 'application/postscript' at the Job Level and "document-format" = 'text/plain' in this Create-  
 511 Document request, this Document will be 'text/plain'. If the next Create-Document request for this Job omits  
 512 the "document-format" Operation attribute, that Document will be 'application/postscript'.

513 **3.1.1.4 Ignoring unsupported or improper Operation attributes:**

514 The Printer MUST ignore any Operation attributes which are unsupported or are not defined for use with the  
 515 Create-Document operation, such as "ipp-attribute-fidelity" (see section 4.4.1) and "job-mandatory-attributes"  
 516 (see section 4.4.2) which are defined for use in Job Creation operations only.

517 **Group 2: Document Template Attributes**

518 **Any Document Template attributes in any order:**

519 The client OPTIONALLY supplies a set of Document Template attributes, that is, any attributes indicated in  
 520 Table 9 in the "Defined for use" column labeled with a "y" in the "D" column. These Document Template

521 attributes are said to be supplied at the Document Level and apply to the Document object, overriding any  
 522 Document Template attributes supplied at the Job Level. For example, if “media” = ‘na-letter-white’ at the  
 523 Job Level and “media” = ‘na-letter-transparency’ in this Create-Document request, this Document will be ‘na-  
 524 letter-transparency’. If the next Create-Document operation for this Job omits the “media” Operation  
 525 attribute, that Document will be ‘na-letter-white’ which it inherits from the Job.

526 If the client is not supplying any Document Template attributes in the request, the client SHOULD omit Group  
 527 2 rather than sending an empty group. However, a Printer object MUST be able to accept an empty group.

528 The client MUST NOT supply the document data in this operation request. See Send-~~Document~~-Data  
 529 operation (section 3.2).

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

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

- 536 - creates a new Document object and adds it to the specified Job object,
- 537 - assigns the lowest document number not yet used by this Job, starting a 1. Copy the document number  
 538 assigned to the Document object's "document-number" Document Description attribute.
- 539 - stores a generated Document name in the "document-name" Document Description attribute in the natural  
 540 language and charset requested (see [rfc2911] section 3.1.4.1) (if those are supported, otherwise using the  
 541 Printer object's default natural language and charset), and
- 542 - at job processing time, uses its corresponding default value attributes for the supported Document Template  
 543 attributes that were (1) not supplied by the client as IPP attributes and (2) not embedded instructions in the  
 544 document data.

### 545 3.1.2 Create-Document Response

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

#### 547 Group 1: Operation Attributes

##### 548 Status Message:

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

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

553 (1) the “ipp-attribute-fidelity” Operation attribute (see section 4.4.1) with a ‘true’ value and the client  
 554 supplies any unsupported and/or conflicting Job Template or Document Template attributes in this  
 555 Document Creation request OR

556 (2) the “ipp-attribute-fidelity” Operation attribute (section 4.4.1) was omitted or was supplied with a  
 557 ‘false’ value or had omitted it and the client had supplied keyword values of the “job-mandatory-  
 558 attributes” Operation attribute (see sections 4.4.2 and 6.1.2) (in the original Job Creation operation)

559 that identified attributes supplied in this [Create-Document](#) request that are unsupported and/or  
560 conflicting.

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

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

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

#### 566 **Group 2: Unsupported Attributes**

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

568 The value of the "ipp-attribute-fidelity" and the "job-mandatory-attributes" Operation attributes supplied by the  
569 client in the original Job Creation request does not affect what attributes the Printer object returns in this  
570 group. The values of these two Operation attributes in the original Job Creation request only affects whether  
571 the Create-Document operation is accepted or rejected. If the request is accepted, the client ~~may~~ **MAY**  
572 query the Document object using the Get-Document-Attributes operation (see section 3.5) requesting the  
573 unsupported attributes that were returned in the create response to see which attributes were ignored (not  
574 stored on the Document object) and which attributes were stored with other (substituted) values.

#### 575 **Group 3: Job Object Attributes**

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

579 "job-uri" (uri) - see [rfc2911] section 4.3.1

580 "job-id" (integer(1:MAX)) - see [rfc2911] section 4.3.2

581 "job-state" (type1 enum) - see [rfc2911] section 4.3.7

582 "job-state-reasons" (1setOf type2 keyword) - see [rfc2911] section 4.3.8

583

584 The Printer MAY return:

585 "job-state-message" (text(MAX)) - see [rfc2911] section 4.3.9

586 "number-of-intervening-jobs" (integer(0:MAX)) - see [rfc2911] section 4.3.15

587

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

##### 589 **3.1.2.1 document-number (integer(1:MAX))**

590 The Printer MUST return the document number of this Document object that was ~~either~~ assigned by the  
591 Printer starting with 1 for each Job ~~(see section 3.1.1) or supplied by the client (see section 1.1.1.1).~~

##### 592 **3.1.2.2 document-id-uri (uri)**

593 The Printer MUST return the document id of this Document object as a URI as assigned by the Printer (see  
594 section 8.2.12).

##### 595 **3.1.2.3 document-state (type1 enum)**

596 The Printer MUST return the state of this Document object (see section 8.2.20).

### 597 3.1.2.4 document-state-reasons (1setOf type2 keyword)

598 The Printer MUST return the associated state reasons for this Document (see section 8.2.22).

### 599 3.1.2.5 document-state-message (text(MAX))

600 The Printer MAY return the localized description of the "document-state" and "document-state-reasons"  
601 values for this Document (see section 8.2.21).

## 602 3.2 Send-Document-Data Operation

603 ~~ISSUE 01: OK: OK to rename Send-Data to Send-Document-Data to reflect the object on which it operates?~~

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

607 Since the Create-Document and the Send-Document-Data operation that follows could occur over an arbitrarily long  
608 period of time for a particular Document, a client MUST send the Send-Document-Data operation within an IPP  
609 Printer defined minimum time interval after the receipt of the previous request for the job. If a Printer object supports  
610 the Document object, the Printer object MUST support the "multiple-operation-time-out" attribute (see [rfc2911]  
611 section 4.4.31). This attribute indicates the minimum number of seconds the Printer object will wait for the next send  
612 operation before taking some recovery action. See the description under Send-Document in [rfc2911] section 3.3.1,  
613 for the possible Printer actions, if the client does not supply a Send-Document-Data request in time.

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

### 618 3.2.1 Send-Document-Data request

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

#### 620 Group 1: Operation Attributes

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

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

##### 623 Target:

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

##### 629 Requesting User Name:

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

#### 632 Group 2: Document Content

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

### 635 3.2.2 Send-Document-Data Response

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

#### 637 Group 1: Operation Attributes

##### 638 Status Message:

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

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

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

#### 644 Group 2: Unsupported Attributes

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

#### 646 Group 3: Job Object Attributes

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

#### 649 Group 4: Document Object Attributes

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

## 652 3.3 Send-Document Operation

653 This REQUIRED<sup>8</sup> operation allows a client to submit multiple documents in a single Job by making a Send-Document  
654 request for each Document. In this specification, the Send-Document creates a Document object ([rfc2911] did not  
655 have a Document object). A Printer MUST support this operation with the semantics specified in [rfc2911] and with  
656 the extension defined in this specification, since this specification REQUIRES the Printer to support multiple  
657 document jobs.

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

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

### 663 3.3.1 Send-Document Request

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

---

<sup>8</sup> The Send-Document operation is REQUIRED in this specification while it was OPTIONAL in [rfc2911]. This difference is because this specification REQUIRES Printer support of multiple document jobs, while [rfc2911] did not.

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

666 As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 6.  
 667 For example, "compression", "document-format", and "document-name". So this group is the same as for  
 668 Create-Document (see section 3.1.1).

**669 Group 2: Document Attributes (new - not in [rfc2911])**

670 The client OPTIONALLY supplies a set of Document Template attributes as listed in Table 9. For example,  
 671 "media" and "number-up". If the client is not supplying any Document Template attributes in the request, the  
 672 client SHOULD omit Group 2 rather than sending an empty group. However, a Printer object MUST be able  
 673 to accept an empty group.

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

675 The client MUST supply the document data in-line to be processed for this Document if the "last-document"  
 676 flag is set to 'false'. However, since a client might not know that the previous Document object created with a  
 677 Create-Job, Send-Document, or Send-URI operation was the last document (i.e., the "last-document"  
 678 attribute was set to 'false'), it is legal to send a Send-Document request with no document data where the  
 679 "last-document" flag is set to 'true'. For this case, the Printer MUST NOT increment the value of the Job  
 680 object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is  
 681 not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and  
 682 Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is  
 683 only an empty job which is scheduled and processed normally.

**684 3.3.2 Send-Document Response**

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

**686 Group 1: Operation Attributes (as in [rfc2911] Group 1)****687 Status Message:**

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

**691 Natural Language and Character Set:**

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

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

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

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

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

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

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

### 701 3.4 Send-URI Operation

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

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

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

### 713 3.5 Get-Document-Attributes Operation

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

718 The Printer MUST return the attributes that a client supplied in the Create-Document, Send-Document, or Send-URI  
719 operations, plus any Document Description attributes that the Printer has generated. The Printer MUST NOT return  
720 any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object  
721 attributes and return them as Job object attributes. Thus the Get-Document-Attributes returns to clients the attributes  
722 that clients submitted with the Job object and with the Document object.

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

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

731 - 'document-template': the subset of the Document Template attributes that apply to a Document object (the "D"  
732 column in Table 9) that the implementation supports for Document objects.

733 - 'document-description': the subset of the Document Description attributes specified in the "Doc" column of  
734 Table 10 that the implementation supports for Document objects.

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

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

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

### 743 3.5.1 Get-Document-Attributes Request

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

#### 746 Group 1: Operation Attributes

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

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

##### 749 Target:

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

##### 755 Requesting User Name:

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

#### 758 3.5.1.1 "requested-attributes" (1setOf keyword):

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

### 762 3.5.2 Get-Document-Attributes Response

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

#### 764 Group 1: Operation Attributes

##### 765 Status Message:

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

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

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

#### 773 Group 2: Unsupported Attributes

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

775 The response **NEED-NOT-MAY** contain **or MAY omit** the "requested-attributes" Operation attribute with any  
776 supplied values (attribute keywords) that were requested by the client but are not supported by the Printer. If  
777 the Printer object does return unsupported attributes referenced in the "requested-attributes" Operation

778 attribute and that attribute included group names, such as 'all', the unsupported attributes MUST NOT  
779 include attributes described in the standard but not supported by the implementation.

### 780 **Group 3: Document Object Attributes**

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

## 791 **3.6 Get-Documents Operation**

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

795 This operation is similar to the Get-Document-Attributes operation (see section 3.5), except that this Get-Documents  
796 operation returns attributes from all Document objects contained in the Job object, instead of from a single selected  
797 Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return  
798 attributes that were submitted by a client when the Document object was created by the Create-Document, Send-  
799 Document, or Send-URI operations and possibly modified by the Set-Document-Attributes operation (see section  
800 3.7).

### 801 **3.6.1 Get-Documents Request**

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

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

#### 806 **Group 1: Operation Attributes**

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

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

##### 809 **Target:**

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

##### 812 **Requesting User Name:**

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

### 815 3.6.1.1 "limit" (integer(1:MAX)):

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

### 822 3.6.1.2 "requested-attributes" (1setOf type2 keyword):

823 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute. It is a set of  
 824 Document attribute names and/or attribute groups names in whose values the requester is interested. This  
 825 set of attributes is returned for each Document object that is returned. The allowed attribute group names  
 826 are the same as those defined in the Get-Documents-Attributes operation in section 3.5.1.

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

829 'document-number' (see section 8.2.19)

830 'document-id-uri' (see section 8.2.12).

831

## 832 3.6.2 Get-Documents Response

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

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

### 838 Group 1: Operation Attributes

#### 839 Status Message:

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

#### 843 Natural Language and Character Set:

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

### 845 Group 2: Unsupported Attributes

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

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

### 852 Groups 3 to N: Document Object Attributes

853 The Printer object responds with one set of Document Object Attributes for each returned Document object.  
 854 The Printer object ignores (does not respond with) any requested attribute or value which is not supported or

855 which is restricted by the security policy in force, including whether the requesting user is the user that  
856 submitted the job (job originating user) or not (see [rfc2911] section 8). However, the Printer object MUST  
857 respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which  
858 the Printer object does not know the value, unless it would violate the security policy. See the description of  
859 the "out-of-band" values in the beginning of [rfc2911] section 4.1.

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

### 862 3.7 Set-Document-Attributes Operation

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

867 This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see  
868 [rfc3380] section 4.2). The only differences are that the Set-Document-Attributes operation is directed at a Document  
869 object rather than a Job object. As with the Set-Job-Attributes operation, The Set-Document-Attributes operation  
870 can add an attribute to the Target object, accepts the 'delete-attributes' out-of-band value to remove an attribute from  
871 the Target object. In addition the validation is the same as the Create-Document, Send-Document, and Send-URI  
872 operations that create Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer  
873 Description attributes (see [rfc2911] section 3.1).

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

877 If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2),  
878 then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic  
879 effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as  
880 if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer  
881 applies its default attribute or behavior with lower precedence than the PDL (see the beginning of [rfc2911] section  
882 4.2 and [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-  
883 Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.  
884 However, a client can re-establish such a deleted Document attribute with any supported value(s) using a  
885 subsequent Set-Document-Attributes operation.

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

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

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

906 **Table 5 - Document State Table for the Set-Document-Attributes operation**

Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
'pending'	'pending'	'successful-ok'
'pending'	'pending'	'successful-ok' - needed resources are not ready (the Job MAY change state, but the Document MUST NOT).
'processing'	'processing'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

907

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

### 911 **3.7.1 Settable and READ-ONLY Document Description attributes**

912 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:  
 913 all Document Template document ("xxx") attributes  
 914 that the implementation supports (see the column labeled "D" in Table 9).

915 Almost all Document Description attributes (see [rfc2911] section 4.3) MUST NOT be settable, i.e., they are defined  
 916 to be READ-ONLY. Only Document Description attributes marked with "(r/w) in Table 9 MAY be settable using Set-  
 917 Document-Attributes. The Printer MUST reject a Set-Document-Attributes request that attempts to set any attributes  
 918 in Table 10 that is not marked "(r/w).

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

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

### 925 **3.7.2 Set-Document-Attributes Request**

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

**927 Group 1: Operation Attributes****928 Natural Language and Character Set:**

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

**930 Target:**

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

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

**944 Requesting User Name:**

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

**947 Group 2: Document Attributes**

948 The client MUST supply a set of Document Template attributes with one or more values (including explicitly  
949 allowed out-of-band values) as listed in column labeled "D" in Table 9 - Job Template and Document  
950 Template attributes and Document Description attributes flagged with "(r/w)" and listed in the column labeled  
951 "Doc" in Table 10 - Job and Document Description attributes, and any attribute extensions supported by the  
952 Printer. The value(s) of each Document attribute supplied in Group 2 replaces the value(s) of the  
953 corresponding Document attribute on the target Document object. For attributes that can have multiple  
954 values (1setOf), all values supplied by the client replace all values of the corresponding Document object  
955 attribute.

956 In order to set the Document's "document-message" Document Description attribute (see section 8.2.16), the  
957 client MUST supply the attribute in Group 2, rather than supplying a "document-message" Operation attribute  
958 in Group 1.

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

**961 3.7.3 Set-Document-Attributes Response**

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

**963 Group 1: Operation Attributes****964 Status Message:**

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

**968 Natural Language and Character Set:**

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

**970 Group 2: Unsupported Attributes**

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

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

- 977 1. The number of attributes supplied by the client exceeds the maximum number that the Printer  
978 supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see  
979 [rfc2911] section 13.1.4.9).
- 980 2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band  
981 attribute value (see [rfc2911] section 3.1.7 and [rfc2910]) and the 'client-error-attributes-or-values-  
982 not-supported' (see [rfc2911] section 13.1.4.12).
- 983 3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation: return the  
984 attribute with the 'not-settable' out-of-band attribute value (see [rfc3380] section 8.1) and the  
985 'client-error-attributes-not-settable' status code (see [rfc3380] section 7.1).
- 986 4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.  
987 If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not  
988 supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911]  
989 section 13.1.4.12).
- 990 5. The values of some of the supplied attributes conflict with one another and/or other Document  
991 attribute values not being set: if the conflicting attribute in the operation has a single value return  
992 the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute  
993 and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-  
994 conflicting-attributes' status code (see [rfc2911] section 13.1.4.15).

**995 3.8 Cancel-Document Operation**

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

1000 The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified  
1001 Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-  
1002 reasons" Document Description attribute to 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed  
1003 again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job  
1004 operation (see [rfc2911] section 3.3.7), any canceled Documents are also printed again. Thus Cancel-Document has  
1005 the same semantics as Cancel-Job (see [rfc2911] section 3.3.3), which only cancels the processing of the job, and  
1006 doesn't delete the Job object itself. See the Delete-Document operation (section 3.9) to remove the Document object  
1007 itself immediately from the Job and Printer.

1008 The Cancel-Document operation does not affect the states of any of the other Document objects in the job. If the Job  
1009 was processing and there are more Documents to be processed, the Printer does so. If there are no further

1010 Documents to process, the Job moves to the 'completed' state as usual whenever there is no more processing to be  
 1011 done.

1012 The Printer MUST accept or reject the request based on the document's current state and transition the document to  
 1013 the indicated new state as follows:

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

1014 Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document  
 1015 states, the Printer object MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"  
 1016 attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] section  
 1017 4.3.8).

1018 Rule 2: If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons"  
 1019 attribute, then the Printer object MUST reject a Cancel-Document operation.

1020 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job  
 1021 owner or an operator or administrator of the Printer object (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer  
 1022 MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-  
 1023 authorized' as appropriate.

1024 **3.8.1 Cancel-Document Request**

1025 The following groups of attributes are part of the Cancel-Document Request:

1026 **Group 1: Operation Attributes**

1027 **Natural Language and Character Set:**

1028 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

1029 **Target:**

1030 The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after  
 1031 either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s)  
 1032 which define the target Document object for this operation as described in section [rfc2911] 3.1.5. If the  
 1033 client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the  
 1034 'client-error-bad-request' status code.

1035 **Requesting User Name:**

1036 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in  
 1037 [rfc2911] section 8.3.

**3.8.1.1 document-message (text(MAX))****Operation attribute**

The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also support the corresponding "document-message" (text(MAX)) Document Description attribute (see section 8.2.16) and copy this value to the "document-message" Document Description attribute. The end user can use this Document Description attribute as a message to the operator and the operator can use it as a message to the user. The Printer MAY print this message on a document start sheet for this document, if any.

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

**3.8.2 Cancel-Document Response**

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

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

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

**Natural Language and Character Set:**

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

**Group 2: Unsupported Attributes**

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

Once a successful response has been sent, the implementation guarantees that the Document will eventually end up in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document enters the 'canceled' document-state (see section 8.2.20), the "document-state-reasons" attribute (see section 8.2.22) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

**3.9 Delete-Document Operation**

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

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

1078 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the  
 1079 Cancel-Document operation (see section 3.8).

## 1080 4 Semantic extensions to Job operations

1081 This section defines the new Close-Job operation and the effects that Job operations have on the Document object.  
 1082 Printer and Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object  
 1083 and the Document object has no effect on the semantics of the Printer and Subscription operations. The Job  
 1084 operations that MUST NOT have any effect on the Document object because they are defined to affect the Job  
 1085 object as a whole are: **Get-Job-Attributes**<sup>9</sup> ([rfc2911] section 3.3.4), **Get-Jobs**<sup>10</sup> ([rfc2911] section 3.2.6), **Hold-Job**  
 1086 ([rfc2911] section 3.3.5), **Promote-Job** ([adm-ops] section 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section  
 1087 3.3.2), **Resume-Job** ([adm-ops] section 4.3.2), **Schedule-Job-After** ([adm-ops] section 4.4.2), **Set-Job-Attributes**  
 1088 ([rfc3380] section 4.2), and **Validate-Job** ([rfc2911] section 3.2.3).

1089 The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations  
 1090 are, in alphabetical order:

### 1091 4.1 Cancel-Current-Job ([adm-ops] section 4.2)

1092 The Printer sets the “document-state” Document Description attribute to ‘canceled’ and the “document-state-reasons”  
 1093 Document Description attribute to ‘canceled-by-xxx’ for any documents in the current Job that have not yet reached a  
 1094 terminal state (‘completed’, ‘canceled’, or ‘aborted’), where “xxx” is ‘user’ or ‘operator’. See [adm-ops] section 4.2.

### 1095 4.2 Cancel-Job ([rfc2911] section 3.3.3)

1096 The Printer sets “document-state” Document Description attribute to ‘canceled’ and the “document-state-reasons”  
 1097 Document Description attribute to ‘canceled-by-user’ or ‘canceled-by-operator’ for *all* Document objects in the  
 1098 identified Job that have not yet reached a terminal state (‘completed’, ‘canceled’, or ‘aborted’).

### 1099 4.3 Close-Job ~~(new)~~

1100 ~~ISSUE 02: OK to add Close-Job and to REQUIRE a Printer to support it, since PSI is using it?~~

1101 This REQUIRED operation closes the Job<sup>11</sup>. The Printer MUST support this operation. The client MAY issue this  
 1102 operation to close the job, instead of supplying the “last-document” Operation attribute (see section 3.1.1.1) with a  
 1103 ‘true’ value in a Document Creation operation (or a Send-Documents operation - see [RFC2911,rfc2911] section  
 1104 3.3.1). The Printer MUST support both means of closing jobs for backward compatibility with [rfc2911].

1105 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job  
 1106 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see [rfc2911]  
 1107 sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: ‘client-error-forbidden’, ‘client-error-  
 1108 not-authenticated’, or ‘client-error-not-authorized’ as appropriate.

<sup>9</sup> The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in Create-Documents, Send-Documents, or Send-URI to the Job object as observable by the client in any Get-Job-Attributes operation responses.

<sup>10</sup> The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in Create-Documents, Send-Documents, or Send-URI to the Job object as observable by the client in any Get-Job-Attributes operation responses.

<sup>11</sup> Close-Job is a new operation defined by this Document object specification and is not defined in [RFC2911].

1109 **4.3.1 Close-Job Request**

1110 The client supplies the following groups as part of the Close-Job Request:

1111 **Group 1: Operation Attributes**

1112 **Natural Language and Character Set:**

1113 First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes  
 1114 as described in [rfc2911] section 3.1.4.1. The Printer object MUST copy these values to the corresponding  
 1115 Job Description attributes described in [rfc2911] sections 4.3.19 and 4.3.20.

1116 **Target:**

1117 Next, the client MUST supply either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri"  
 1118 (uri) Operation attribute(s) which define the target Job object for this operation as described in [rfc2911]  
 1119 section 3.1.5. The client MAY supply the remaining Operation attributes in any order following:

1120 **Requesting User Name:**

1121 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in  
 1122 [rfc2911] section 8.3.

1123 **Group 2: Document Template Attributes:** *MUST NOT be present.*

1124 **Group 3: Subscription Attributes (see [ntfy] section 11.1.3.1):** *MUST NOT be present.*

1125 **4.3.2 Close-Job Response**

1126 The Printer object MUST return the following sets of attributes to the client as part of the Close-Job response:

1127 **Group 1: Operation Attributes**

1128 **Status Message:**

1129 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a  
 1130 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as  
 1131 described in [rfc2911] sections 13 and 3.1.6.

1132 **Natural Language and Character Set:**

1133 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

1134 **Group 2: Unsupported Attributes**

1135 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1136 **Group 3: Job Object Attributes**

1137 In addition, the Printer MUST return the same Job status attributes that [rfc2911] REQUIRES for the Send-  
 1138 Document and Send-URI operation responses (which are the same as for the Print-Job response - [rfc2911]  
 1139 section 3.2.1.2):

- 1140 "job-uri" (uri) - see [rfc2911] section 4.3.1
- 1141 "job-id" (integer(1:MAX)) - see [rfc2911] section 4.3.2
- 1142 "job-state" (type1 enum) - see [rfc2911] section 4.3.7
- 1143 "job-state-reasons" (1setOf type2 keyword) - see [rfc2911] section 4.3.8

1144 The Printer MAY return:

1146 "job-state-message" (text(MAX)) - see [rfc2911] section 4.3.9  
 1147 "number-of-intervening-jobs" (integer(0:MAX)) - see [rfc2911] section 4.3.15  
 1148

## 1149 4.4 Job Creation operations

1150 This section defines the extensions to Job Creation operations.

1151 The following Operation attribute extensions are defined for use in all the Job Creation operations and Validate-Job:

### 1152 4.4.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

1153 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the  
 1154 client supplies an unsupported attribute or value in a Job Creation operation or a subsequent Document Creation  
 1155 operation for this job. The value 'true' indicates that total fidelity to client supplied Job Template and Document  
 1156 Template attributes and values is required for this Job Creation operation and all subsequent Document Creation  
 1157 operations for this job. If the client supplies the value 'false' or omits the attribute, then the Printer MUST accept the  
 1158 Job Creation operation and all subsequent Document Creation operations even if the client supplies unsupported  
 1159 attributes or values in them.

1160 The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 8.1.1) and use  
 1161 its value for validating subsequent Document Creation operations for this job.

1162 Note: The inheritance of the effect of the "ipp-attribute-fidelity" Operation attribute by subsequent Document Creation  
 1163 operations is like the inheritance of other Operation attributes.

### 1164 4.4.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute

1165 ~~ISSUE 03: Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it supports~~  
 1166 ~~the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity" attribute?~~

1167 This ~~OPTIONAL~~ **REQUIRED**<sup>12</sup> Operation attribute identifies which Job Template and Document Template attributes  
 1168 the Printer MUST ~~honor~~ **Honor** in this Job Creation request and all subsequent Document Creation requests for this  
 1169 job. The Printer MUST reject this Job Creation operation or any subsequent Document Creation operations for this  
 1170 job, if the client supplies an unsupported Job Template or Document Template attribute or value in the request that is  
 1171 also identified in this list. The client MAY supply this attribute in a Job Creation operation. If the Printer supports this  
 1172 Operation attribute, the Printer MUST support this attribute in Job Creation operations and Validate-Job with any  
 1173 values and MUST NOT support this attribute in any other operations.

1174 The values of the "job-mandatory-attributes" attribute are the keyword attribute names that identify Job Template  
 1175 and/or Document Template attributes, for example, 'job-hold-until', 'job-finishing' (see section 7.1.4), 'copies' and  
 1176 'media'. In order to identify a member attribute of a collection attribute, the keyword names of both the collection  
 1177 attribute and the member attribute are given separated by a period (.) character. For example, to make the "media"  
 1178 attribute of the "cover-front" collection attribute mandatory, supply the keyword value: 'cover-front.media'.

1179 If the Printer supports the "document-format-details" (1setOf collection) operation/Document Description attribute  
 1180 (see sections 6.1.2 and 8.2.9), the Printer MUST support any of the 'document-format-details.xxx' keywords<sup>13</sup> that

<sup>12</sup> The "job-mandatory-attributes" operation attribute is REQUIRED for conformance to this Document Object specification. It is not REQUIRED for conformance to any other specification. See the definition of REQUIRED in section 2.1.

<sup>13</sup> The "job-mandatory-attributes" operation attribute identify Job Template and Document Template attributes, so it is an exception for the "job-mandatory-attributes" operation attributes to identify "document-format-details" member attributes, since "document-format-details" is an operation/Job Description attribute, not a Job Template or Document

1181 identify a member attribute of the “document-format-details” Operation attribute so that the client can specify that the  
 1182 Printer MUST Honor a supplied version or other property of the supplied Document object.

1183 The Printer MUST ignore ~~this the~~ “job-mandatory-attributes” ~~attribute~~ Operation attribute if the client supplies the “ipp-  
 1184 attribute-fidelity” Operation attribute (see section 4.4.1) with a ‘true’ value in this operation, since a ‘true’ value  
 1185 indicates that the Printer MUST ~~honor~~ Honor all supplied Job Template and Document Template attributes.

1186 The Printer MUST copy this attribute to the corresponding “job-mandatory-attributes” Job Description attribute (see  
 1187 section 4.4.2) for auditing and trouble shooting purposes and use its value for validating subsequent Document  
 1188 Creation operations for this job.

1189 ~~If a~~ A client MUST NOT supply ~~ies~~ this “job-mandatory-attributes” Operation attribute in a Document Creation  
 1190 operation. If a client does supply it, the Printer MUST ignore and only support the “job-mandatory-attributes”  
 1191 Operation attribute supplied at it; only the Job level ~~attribute MUST have effect~~. Thus the “job-mandatory-attributes”  
 1192 Operation attribute controls all other attributes supplied at the Job Level and Document Level uniformly. Note: The  
 1193 inheritance of the effect of “job-mandatory-attributes” Operation attribute supplied at the Job Level by subsequent  
 1194 Document Creation operations is like the inheritance of other operation and Job Template attributes.

#### 1195 **4.4.3 Create-Job ([rfc2911] section 3.2.4)**

1196 The Printer creates the Job object with all of the mixture of Job and Document attributes supplied in the Create-Job  
 1197 operation. The Document objects that are subsequently created for the specified Job inherit the Document attributes  
 1198 from the Job object. However, the Printer MUST NOT copy down any Job Level attributes to the Document object as  
 1199 observable by a client in any Get-Documents or Get-Documents-Attributes operation responses.

1200 [rfcA Printer that supports the Document object MUST support the Create-Job operation<sup>14</sup> since the Create-Job  
 1201 operation is the only operation that creates a Job object so that subsequent Document objects can be created in the  
 1202 Job object.

#### 1203 **4.4.4 Print-Job ([rfc2911] section 3.2.1)**

1204 The Printer creates one Document object as a side effect of the Print-Job operation. All of the attributes supplied by  
 1205 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on  
 1206 the Document object because the Document object inherits them from the Job object. The Printer MUST populate  
 1207 the single Document object’s “document-state”, “document-state-reasons”, and “document-number” Document  
 1208 Description attributes with appropriate values. Thus a Get-Documents or Get-Documents-Attributes for a Job created  
 1209 by Print-Job will return no attributes supplied by the client, but will return the populated Document Description  
 1210 attributes.

#### 1211 **4.4.5 Print-URI ([rfc2911] section 3.2.2)**

1212 The Printer creates one Document object as a side effect of the Print-URI operation. All of the attributes supplied by  
 1213 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on  
 1214 the Document object because the Document object inherits them from the Job object. The Printer MUST populate  
 1215 the Document object’s “document-state”, “document-state-reasons”, and “document-number” Document Description  
 1216 attributes with appropriate values. Thus a Get-Documents or Get-Documents-Attributes for a Job created by Print-Job  
 1217 will return no attributes supplied by the client, but will return the populated Document Description attributes.

---

Template attribute. The PWG Semantic Model will have an analogous extension, where the JobMandatoryElements  
 element usually contains Processing element names, but in this case can contain Document Description element  
 names.

<sup>14</sup> In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

#### 1218 **4.5 Purge-Jobs ([rfc2911] section 3.2.9)**

1219 The Printer removes all Job and all of their contained Document objects.

#### 1220 **4.6 Release-Job ([rfc2911] section 3.3.6)**

1221 The Printer moves the job to the 'pending' state, if there are no other "job-state-reasons" to hold the job. The values  
1222 of the "document-state-reasons" attributes MUST NOT affect job scheduling (see Table 12), only the Job's "job-state-  
1223 reasons" values.

#### 1224 **4.7 Reprocess-Job ([adm-ops] section 4.1)**

1225 The Printer processes the Job again by processing *all* Documents in the Job, including ones that have been  
1226 canceled by a previous Cancel-Document operation. Therefore, the Printer removes any 'canceled-by-xxx' values  
1227 from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes.

#### 1228 **4.8 Restart-Job ([rfc2911] section 3.3.7)**

1229 The Printer starts the Job over again by processing *all* Documents in the Job, including ones that have been  
1230 canceled by a previous Cancel-Document operation. Therefore, the Printer removes any 'canceled-by-xxx' values  
1231 from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes and

#### 1232 **4.9 Send-Document ([rfc2911] section 3.3.1)**

1233 The Printer accepts a new Document Attributes group (Group 4) that the client can supply Document Template  
1234 attribute and creates a Document object (see section 3.3).

#### 1235 **4.10 Send-URI ([rfc2911] section 3.3.2)**

1236 The Printer accepts a new Document Attributes group (Group 4) that the client can supply Document Template  
1237 attribute and creates a Document object (see section 3.4).

#### 1238 **4.11 Suspend-Current-Job ([adm-ops] section 4.3.1)**

1239 The Printer suspends the current job and sets the Job's "job-state" Job Description attribute to 'processing-stopped'  
1240 and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user' or 'operator'. The Documents' "document-  
1241 state" and "document-state-reasons" Document Description attributes are unaffected (but the Documents are not  
1242 processed any further, since the Job is stopped).

### 1243 **5 Attribute Precedence during job processing**

1244 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including  
1245 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document  
1246 Object attributes, Document Override attributes, Job Object attributes, PDL instructions, PDL Interpreter initialization  
1247 files, and Printer object defaults. Since each attribute can be specified for all of these levels, it is important to define  
1248 which level takes precedence when the same attribute occurs at different levels with differing values.

1249 The attribute precedence model has the following features:

- 1250 1) In principle, each defined attribute can occur at each of the precedence levels.
- 1251 2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print  
1252 driver, submission client, protocol, and Printer:
- 1253 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,  
1254 operator, Printer object, and the output device hardware.
  - 1255 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job  
1256 pending, job processing.
- 1257 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print  
1258 driver, submission client, protocol, and Printer.
- 1259 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to  
1260 the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to  
1261 reflect the user's wishes.

1262 The following levels of Attribute Precedence are defined in order of decreasing priority:

- 1263 1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section  
1264 3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute  
1265 to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =  
1266 'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the  
1267 long edge.

1268 Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for  
1269 its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all  
1270 Printers independent of the "pdl-override-supported" value.

- 1271 2. **Document Level - page override programming** - The special "page-overrides" collection Document  
1272 Template attribute (see [pwg5100.4]) supplied at the Document Level, that is, in a Create-Documents,  
1273 Send-Documents, or Send-URI operation, that contains the attributes that are to have the page override  
1274 status for the specified ranges of pages in the Input-Documents or the Output-Documents. Supplied by the  
1275 client when submitting a Document object, or set by the user or operator after the Document has been  
1276 accepted either using the Set-Documents-Attributes operation, or by the operator using means local to the  
1277 Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

- 1278 3. **Job Level - page override programming** - The special "page-overrides" collection Job Template  
1279 attribute (see [pwg5100.4]) supplied at the Job Level, that is, in a Job Creation operation, that contains  
1280 the attributes that are to have the page override status for the specified ranges of pages in the Input-  
1281 Document or the Output-Documents. Supplied by the client when submitting a job either in the protocol,  
1282 or set by the user or operator after the job has been accepted either using the Set-Job-Attributes  
1283 operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-  
1284 documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

- 1285 4. **Document Level - Document object attributes** - The Document attributes supplied at the Document  
1286 Level, that is, in a Create-Documents, Send-Documents, or Send-URI operation to apply to the Input  
1287 Document. Supplied by the client when submitting a Document object, or set by the user or operator  
1288 after the Document has been accepted either using the Set-Job-Attributes operation, or by the operator  
1289 using means local to the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

- 1290 5. **Document Level - document override programming** - The special "document-overrides" collection  
1291 Operation attribute (see [pwg5100.4]) supplied by the client in the Send-Documents or Send-URI request.

- 1292 The collection contains the member attributes that are to override attributes specified at lower  
 1293 precedence for the specified range of documents, including the current Document and subsequently  
 1294 created Documents. Clients that support the Document object SHOULD supply the attributes as  
 1295 Document Template attributes directly when creating the Document, instead of using the Operation  
 1296 attribute mechanism. Example: "document-overrides" = {"input-documents" = '5:5'; "media" =  
 1297 'transparency'}
- 1298 6. **Job Level - document override programming** - The special "document-overrides" collection Job  
 1299 Template attribute (see [pwg5100.4]) that contains the attributes that are to have the document override  
 1300 status for the specified Input-Documents or Output-Documents. Supplied by the client when submitting a  
 1301 job either in the protocol, or set by the user or operator after the job has been accepted either using the  
 1302 Set-Job-Attributes operation, or by the operator using means local to the Printer. Example: "document-  
 1303 overrides" = {"input-documents" = '5:5'; "media" = 'transparency'}
- 1304 7. **Job Level - Job object and Document object attributes** - The Job attributes and Document attributes  
 1305 supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation. Supplied by the  
 1306 client when submitting a Job in the protocol, or set by the user or operator after the job has been  
 1307 accepted either using the Set-Job-Attributes operation, or by the operator using means local to the  
 1308 Printer. Examples: "media" = 'na-letter' and "copies" = '2'.
- 1309 8. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print  
 1310 driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether  
 1311 PDL document data is actually lower precedence than the preceding levels depends on the  
 1312 implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]  
 1313 section 4.4.28 and [ippsave] section 8.1).  
 1314  
 1315 Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-  
 1316 requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a  
 1317 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"  
 1318 attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-  
 1319 requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation  
 1320 and PCL ~~NEED NOT MAY omit have~~ orientation, in which case, "orientation-requested" takes affect.
- 1321 9. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting  
 1322 each document in a Job. See description of "pdl-init-file" Job Template attribute in [ippsave] Section 5.8.  
 1323 It is immaterial how this file is specified, whether it be by a queue override, job object attribute or printer  
 1324 default – the precedence of the contents of this file is at this level.
- 1325 10. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the  
 1326 higher levels have supplied a value. The Printer implementation MUST supply values for all of the  
 1327 Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,  
 1328 if the output device will use media from the large-capacity input tray if not directed otherwise, the  
 1329 implementation MUST supply the Printer's "media-default" attribute with the 'large-capacity' keyword  
 1330 value without requiring the administrator to configure that value. The implementation MUST allow the  
 1331 administrator to configure the Printer's "xxx-default" attributes to other values, if other value are  
 1332 supported by the implementation. Example: The administrator changes the Printer's "media-default"  
 1333 from 'large-capacity' to 'na-letter'.
- 1334 Note: Because of the requirement that the implementation supply pre-configured values for the  
 1335 Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence  
 1336 level.

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

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

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

Table 6 lists the Operation attributes that clients supply at the Job Level and/or the Document Level.

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

Legend:

- [job-]** indicates an attribute that shouldn't have had a “job-” prefix in its name in [rfc2911], so that the same attribute name could also be used for the Document object as a Document Description attribute. Note: For the PWG Semantic Model, the “job-” prefix is dropped.
- “\_” indicates that the Job or Document Operation attribute is *not* defined.
- \* For most of these Operation attributes the Printer **MUST** copy these Operation attributes to the corresponding Job Description or Document Description attributes. The \* in the Job and Doc column indicate that there is *no* corresponding Job Description or Document Description attribute, respectively. See Table 10 for the corresponding Job and Document Description attributes.
- \*\* these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation operations

**Table 6 - Operation Attributes supplied at the Job and Document Levels in Creation Requests**

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
<b>attributes-charset</b> **	charset	y	y	MUST	MUST	[rfc2911] §3.1.4
<b>attributes-natural-language</b> **	naturalLanguage	y	y	MUST	MUST	[rfc2911] §3.1.4
<b>compression</b>	type3 keyword	y *	y	MAY	MUST	[rfc2911] §3.2.1.1
<b>document-format-details-container-summary</b> *	1setOf collection	-	y	MAY	MAY <sup>15</sup>	§6.1.2
<b>document-creator-application-name</b> *	name(MAX)	-	y	MAY	MAY	§6.1.2.1
<b>document-creator-application-version</b> *	text(127)	-	y	MAY	MAY	§6.1.2.2
<b>document-creator-os-name</b> *	name(40)	-	y	MAY	MAY	§6.1.2.3
<b>document-creator-os-version</b> *	text(40)	-	y	MAY	MAY	§6.1.2.4
<b>document-format</b>	mimeMediaType	y *	y	MAY	MUST	§6.1.2.5

<sup>15</sup> The “document-container-summary” Document Description attribute **MUST** be supported by a Printer that supports a container MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
<b>document-format-device-id*</b>	text(127)	-	y	MAY	MAY	§6.1.2.6
<b>document-format-version*</b>	text(127)	-	y	SHOULD	MUST	§6.1.2.7
<b>document-natural-language</b>	naturalLanguage	y *	y	MAY	MAY	§6.1.2.8
<b>document-format</b>	mimeMediaType	y *	y	MAY	MUST	[rfc2911] §3.2.1.1
<b>document-message **</b>	text(MAX)	-	y	MAY	MAY	§8.2.16
<b>document-name</b>	name(MAX)	y *	y	MAY	MUST	[rfc2911] §3.2.1.1
<b>document-natural-language</b>	naturalLanguage	y *	y	MAY	MAY	[rfc2911] §3.2.1.1
<b>document-overrides<sup>16</sup></b>	1setOf collection	-	y	MAY	MAY	[pwg5100.4] §5.1, §9.2.2
<i>See "document-overrides" in Table 9 for the list of member attributes</i>						
<b>document-uri</b>	uri	y *	y	CMUST <sup>17</sup>	MAY	[rfc2911] §3.2.2
<b>input-document-number</b> <del>DEPRECATED TO BE DELETED in next version of [pwg5100.4]</del>	integer(1:MAX)	-	y	MAY	MAY	§1.1.1.1, [pwg5100.4] §9.2
<b>ipp-attribute-fidelity</b>	boolean	y	-	MAY	MUST	§4.4.1, [rfc2911] §3.2.1.1
<b>[job-]impressions</b>	integer(0:MAX)	y	y	MAY	MAY	[rfc2911] §3.2.1.1
<b>[job-]k-octets</b>	integer(0:MAX)	y	y	MAY	MAY	[rfc2911] §3.2.1.1
<b>job-mandatory-attributes</b>	1setOf type2 keyword	y	-	MAY	<del>MAY</del> MUST <sup>18</sup>	§4.4.2
<b>[job-]media-sheets</b>	integer(0:MAX)	y	y	MAY	MAY	[rfc2911] §3.2.1.1
<b>job-name</b>	name(MAX)	y	-	MAY	MUST	[rfc2911] §4.3.5
<b>job-password</b>	octetString(255)	y	-	MAY	MAY	[ippsave] §4.1
<b>job-password-encryption</b>	type3 keyword   name(MAX)	y	-	MAY	MAY	[ippsave] §4.2
<b>last-document</b>	boolean	-	y	MUST	MUST	[rfc2911] §3.3.1.1
<b>operation-id **</b>	integer(1:0x8FFF)	y *	y *	MUST	MUST	[rfc2911] §3.1.2
<b>original-requesting-user-name</b>	name(MAX)	y	y	MAY	MAY	[adm-ops] §11.7.2.2
<b>page-overrides</b>	1setOf collection	-	y	MAY	MAY	[pwg5100.4] §5.2, §9.2.3
<i>See "page-overrides" in Table 9 for the list of member attributes</i>						
<b>printer-uri **</b>	uri	y <sup>19</sup>	y *	MUST	MUST	[rfc2911] §3.1.5

<sup>16</sup> The "document-overrides" operation attribute is proposed to be removed from the next version of the PWG 5100.4 Candidate Standard in Send-Document and Send-URI operations.

<sup>17</sup> The "document-uri" operation attribute MUST be supplied in the Print-URI Job Creation operation and the Send-URI Document Creation operation, and MUST NOT be supplied in other operations.

<sup>18</sup> ~~ISSUE 03 (repeat): Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it supports the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity" attribute?~~

<sup>19</sup> The Printer copies the "printer-uri" operation attribute to the Job's "job-printer-uri" Job Description attribute and Document's "job-printer-uri" Document Description attribute.

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
<b>request-id **</b>	integer(1:MAX)	y *	y *	MUST	MUST	[rfc2911] §3.1.2
<b>requesting-user-name **</b>	name(MAX)	y *	y *	SHOULD	MUST	[rfc2911] §3.2.1.1
<b>version-number **</b>	X.Y	y *	y *	MUST	MUST	[rfc2911] §3.1.8

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

### 6.1.1 document-format (mimeMediaType)

This REQUIRED Operation attribute identifies the document format of the Document Object. The Printer MUST copy this Operation attribute to the corresponding Document Description attribute. See section 8.2.8 because the semantics of the “document-format” attribute are not duplicated in this section.

If a client supplies the “document-format” Operation attribute with a value that the Printer doesn’t support, the Printer MUST reject the job and return the status code: ‘client-error-document-format-not-supported’ (see [rfc2911] section 3.1.4.11). This behavior is independent of the value of the “ipp-attribute-fidelity” and “job-mandatory-attributes” Operation attribute that the client MAY supply.

### 6.1.2 document-format-details (1setOf collection)

This OPTIONAL Operation attribute supplied in Document Creation operations summarizes the details of the document content, including any files contained in the Document object. See Table 7 for a list of the member attributes along with the client and Printer conformance requirements. If a Printer supports a container MIME type, such as ‘multipart/related’ or ‘application/zip’, the Printer MUST support this “document-format-details” Operation attribute and the corresponding Document Description attribute (see section 8.2.9). If a Printer does not support a container MIME type, it MAY support the “document-format-details” Operation attribute and Document Description attribute. The Printer MUST copy this Operation attribute to the corresponding Document Description attribute (see section 8.2.9). The purpose of the “document-format-details” Operation attribute is to describe the details of the document format or formats in the supplied instance of the Document object, including the container format itself, so that the Printer knows what to expect.

~~However, For a container format,~~ the “document-format-detailscontainer-summary” attribute does not provide means to associate each collection value with particular document in the archive file, so it does not provide a “manifest”<sup>20</sup> of the container. ~~One of the container collection values MAY describe the container format itself, in which case that collection value MUST be the first collection value. The remaining collection values provides the summary of the details of the contained files in any order.~~

~~The member attributes defined for this collection are listed in Table 10 and are the same as those defined for the corresponding Document Description attributes themselves, i.e., a recursive definition. But there MUST NOT be any duplicate collection values, that is, no collection values with all the same member attribute values; its a set, not a sequence. So 100 PostScript files with the same details in a .zip file would MAY have one collection value with the “document-format” member attribute = ‘application/zip’ as the MIME type value and MAY have additional member attributes that give details about the .zip file itself for the top-level “document-format” Document Description attribute for the Document object and (2) a “document-container-summary” Document Description collection attribute with only one MUST have one more collection value containing a “document-format” member attribute with the = ‘application/postscript’ MIME type value and MAY have additional member attributes that give the details about the PostScript files.~~

<sup>20</sup> If the client wants to achieve a “manifest”, that is a complete list of each file in a container, then the client needs to extract each file from the container and submit each one as a separate Document object. Note: that the client can re-compress each file before sending, so the compression isn’t lost.

1395 If a file in a container file is itself a container file, the single “document-format-detailscontainer-summary” (1setOf  
 1396 collection) Operation attribute SHOULD contain the flattened distinct collection values for all files at all nested levels.  
 1397 The refore, the “document-format-detailscontainer-summary” collection attribute is not recursively defined and MUST  
 1398 NOT to contain the “document-format-details” attribute as a member attribute. ISSUE 06: OK that “document-  
 1399 container-summary” is only one level deep?

1400 ISSUE 07: Is the description of “document-container-summary” attribute OK?

1401 **Table 7 - "document-format-detailscontainer-summary" member Operation attributes**

Member Attribute Name	Attribute Syntax	PresentClient supplies	Printer Support	Section
document-creator-application-name	name(MAX)	MAY	MAY	6.1.2.1
document-creator-application-version	text(127)	MAY	MAY	6.1.2.2
document-creator-os-name	name(40)	MAY	MAY	6.1.2.3
document-creator-os-version	text(40)	MAY	MAY	6.1.2.4
document-format	mimeMediaType	MUST	MUST	6.1.2.5
document-format-device-id	text(127)	MAY	MAY	6.1.2.6
document-format-version	text(127)	SHOULD	MUST	6.1.2.7
document-natural-language	naturalLanguage	MAY	MAY	6.1.2.8

1402 ISSUE 08: Are the conformance requirements for the “document-container-summary” attributes OK?

1403 ISSUE: 09: How can a Printer indicate which combinations of document-creator-application-name (name(MAX)),  
 1404 document-creator-application-version (text(127)), document-creator-os-name (name(40)), document-creator-os-  
 1405 version (text(40)), document-format-device-id (text(127)), document-format-version (text(127)), document-format  
 1406 (mimeMediaType) and “document-natural-language (naturalLanguage) are supported?

1407 If a client supplies the “document-format-details” Operation attribute with member attributes and/or values that the  
 1408 Printer doesn’t support, the Printer MUST ignore them, except for the “document-format” member attribute. The  
 1409 Printer MUST reject the request if the “document-format” member attribute is a value that is not supported, same as  
 1410 for the “document-format” Operation attribute (see section 6.1.1). However, if the client had supplied the “ipp-  
 1411 attribute-fidelity” or “job-mandatory-attributes” Operation attribute in the original Job Creation operation<sup>21</sup>, the Printer  
 1412 MUST check for complete support as follows.

1413 The Printer MUST reject the operation if the client had supplied in the original Job Creation operation, either:

1414 (1) the “ipp-attribute-fidelity” Operation attribute (see section 4.4.1) with a ‘true’ value and the client  
 1415 supplies any unsupported “document-format-details” member attributes in this Document Creation  
 1416 request OR

1417 (2) the “ipp-attribute-fidelity” Operation attribute (section 4.4.1) was omitted or was supplied with a  
 1418 ‘false’ value and the client had supplied keyword values of the “job-mandatory-attributes” Operation  
 1419 attribute that identified the “document-format-details” attribute itself (keyword = ‘document-format-  
 1420 details’) or has identified one or more of its member attributes (keyword = ‘document-format-  
 1421 details.xxx’) that are unsupported.

1422 and return the unsupported attributes in the Unsupported Attributes Group in the Document Creation  
 1423 response along with the error status code: ‘client-error-document-format-not-supported’ (see [rfc2911]

<sup>21</sup> Normally the “ipp-attribute-fidelity” and “job-mandatory-attributes” operation attributes apply only to Job Template and Document Template attributes. So having them also apply to the “document-format-details” operation attribute is an exception to the rule.

1424 section 3.1.4.11). To perform the above checks, the Printer MUST compare the supplied “document-format-  
 1425 details” collection value supplied by the client with each of the collection values of the Printer’s “document-  
 1426 format-details-implemented” attribute (see section 9.3). The Printer supports the supplied document details if  
 1427 the supplied collection value is a subset of one of the Printer’s collection values.

1428 The client can determine which member attributes of the “document-format-details” are supporter by  
 1429 querying the Printer’s “document-format-details-supported” attribute (see section 9.2). The client can  
 1430 determine a supported set of document details by querying the Printer’s “document-format-details-  
 1431 implemented” attribute (see section 9.3).

1432 **6.1.2.1 document-creator-application-name (name(MAX))**

1433 This OPTIONAL ~~Document Description member~~ Operation attribute identifies the application that created the  
 1434 document. The version number MUST NOT be included (see the "document-creator-application-version" attribute).  
 1435 Examples: "Photoshop", "Microsoft Word".

1436 **6.1.2.2 document-creator-application-version (text(127))**

1437 ~~The This~~ OPTIONAL ~~Document Description member~~ Operation attribute identifies the version number of the  
 1438 application that created the document. The intent of this attribute is for display to a human being, rather than being  
 1439 parsed by the Printer for purpose of affecting the interpreting by the Printer and so may also include the name of the  
 1440 application, as well as build or service pack numbers. ~~The version number MUST NOT include the application name.~~  
 1441 ~~See “document-creator-application-name” attribute.~~ Examples:

1442 "Winzip® 8.1 (4331)", "Acrobat 5.0.5 10/26/2001", "Microsoft® Word 2000 (9.0.4119 SR-1)"~~"V3.0.", "V6.0"~~

1443 ISSUE: OK that the purpose is human consumption, instead of program consumption and that it be the same as the  
 1444 application shows in its help message?

1445 **6.1.2.3 document-creator-os-name (name(40))**

1446 This OPTIONAL ~~Document Description member~~ Operation attribute identifies the name of the operating system on  
 1447 which the document was generated. Valid values are the operating system names defined in the IANA Operating  
 1448 System name registry [os-names] with the version number portion removed (see the “document-creator-os-version”  
 1449 attribute). IANA Operating System Names are consist of up to 40 *uppercase* US-ASCII letters, hyphen (“-“), period  
 1450 (“.”), and slash (“/”) characters. The zero length string represents unknown (rather than the UNKNOWN value in the  
 1451 IANA OS Registry, since clients are not expected to localize names).

1452 Example IANA OS Registry values: 'AIX', 'DOS', 'LINUX', 'MACOS', 'MSDOS', 'MVS', 'NETWARE', 'OS/2', 'SUN',  
 1453 'SUN-OS', 'UNIX', 'VMS', 'WINDOWS'.

1454 **6.1.2.4 document-creator-os-version (text(40))**

1455 This OPTIONAL ~~Document Description member~~ Operation attribute identifies the version of the operating system on  
 1456 which the document was generated. Valid values include the version portion of any of the operating system names  
 1457 defined in the IANA Registry [os-names]. The value MUST NOT include the name portion of the registered OS name  
 1458 (see “document-creator-os-name” attribute). The zero length string represents unknown (rather than the UNKNOWN  
 1459 value in the IANA OS Registry, since clients are not expected to localize names).

1460 Example values for the indicated “document-creator-os-name” value:

- 1461 For 'AIX': '370', 'PS/2'
- 1462 For 'LINUX': '1.0', '1.2', '2.0', '2.2', '2.4'
- 1463 For 'MVS': 'SP'
- 1464 For 'NETWARE': '3', '3.11', '4.0', '4.1', '5.0'
- 1465 For 'SUN-OS': '3.5', '4.0'

1466 For 'UNIX': 'BSD', 'V', 'V.1', 'V.2', 'V.3', 'PC'  
 1467 For 'WINDOWS': '95', '98', 'CE', 'NT', 'NT-2', 'NT-3', 'NT-3.5', 'NT-3.51', 'NT-4', 'NT-5', '2000', 'XP' [not  
 1468 registered yet]

1469 **6.1.2.5 document-format (mimeMediaType)**

1470 This REQUIRED member Operation attribute specifies the document format (see [rfc2911] §3.2.1.1) of the collection  
 1471 value of which it is a member. The client MUST supply and the Printer MUST support this member attribute in each  
 1472 collection value. The values for this member attribute are Internet Media types (sometimes called MIME types) and  
 1473 have the same values and semantics as for the "document-format" operation/Document Description attribute (see  
 1474 section 8.2.8). For further details see the description of the 'mimeMediaType' attribute syntax in [rfc2911] section  
 1475 4.1.9.

1476 **6.1.2.6 document-format-device-id (text(127))**

1477 This OPTIONAL Document Description member Operation attribute identifies the type of device for which the  
 1478 document was formatted, including manufacturer and model. This attribute is intended to identify document formats  
 1479 that are not portable, e.g., PDLs that are device dependent. The value of this variable MUST exactly match the IEEE  
 1480 1284-2000 Device ID string (see [IEEE1284] clause 6), except the length field MUST not be specified. See the  
 1481 Microsoft Universal Plug and Play [upnp] section 2.2.6 DeviceId parameter for details and examples. Here is an  
 1482 example showing only the required fields for a PostScript document:

```
1483 MANUFACTURER:ACME Co.;COMMAND SET:PS;MODEL:LaserBeam 9;
```

1484 **6.1.2.7 document-format-version (text(127))**

1485 This REQUIRED Document Description member Operation attribute contains the level or version of the document  
 1486 format identified by the "document-format" member attribute. The client MAY supply and the Printer MUST support  
 1487 this member attribute. Possible values are the same as the Printer MIB [rfc1759] prtInterpreterLangLevel (not  
 1488 prtInterpreterLangVersion), such as:

- 1489 '3': For Postscript level 3 [rfc1759].
- 1490 '5e': For PCL 5e [rfc1759].

1491 For those document formats that are defined in standards, the "document-format-version" may contain the official  
 1492 designation of that standard.

1494 ISSUE 10: OK that "document format version" is REQUIRED for a Printer to support?

1495 ISSUE 11: The problem with separating "document format" and "document format version" is how can a Printer  
 1496 describe what versions are supported, since the versions have to be associated with the document format.

1497 Standard Other example values are for those document formats that have well-defined version identification, either in  
 1498 the specification or as an actual field in the document content, such as: text values are:

- 1499 'PDF/X-1:2001': For PDF/X-1 From the ISO standard that specifies PDF/X [iso15930]. ISSUE 12: Or should  
 1500 the official ISO standard number, part number and date, be used instead, e.g., "ISO nnnnn.n 2001"?
- 1501 'PDF/X-1.2001': For PDF/X-1a [iso15930]
- 1502 'TIFF/IT-FP:1998|ISO 12639-1:1996': TIFF/IT [iso12639] - Full Page - baseline From the ISO standard that  
 1503 specified TIFF/IT Profile 1.
- 1504 'TIFF/IT-CT:1998': TIFF/IT [iso12639] - Continuous Tone picture data - baseline
- 1505 'TIFF/IT-FP/P1:1998': TIFF/IT [iso12639] - Full Page - profile 1
- 1506 'TIFF/IT-CT/P1:1998': TIFF/IT [iso12639] - Continuous Tone picture data - profile 1

1507 **6.1.2.8 document-natural-language (naturalLanguage)**

1508 This OPTIONAL member Operation attribute specifies the natural language of the collection value of which it is a  
 1509 member. The values for this attribute are natural language codes (with optional country codes) and have the same

1510 [values and semantics as for the “document-natural-language” operation/Document Description attribute \(see section](#)  
 1511 [8.2.18\) which is not duplicated here.](#)

## 1512 6.2 Override Operation attributes in Send-Document and Send-URI

1513 With the introduction of the Document Object, there is no longer a need for the “document-overrides” (1setOf  
 1514 collection) attribute [pwg5100.4] as an Operation attribute or a Document Template attribute. Also we are unaware  
 1515 of any implementations of the “document-overrides” attribute. Therefore, the intent is to republish the Overrides  
 1516 document [pwg5100.4] with only the “page-overrides” attribute. With the introduction of the Document object, the  
 1517 client simply supplies the Document Template attributes (see Table 9) for each Document Creation request (in a new  
 1518 Document Template attribute group) without needing a collection (and [without needing](#) the “document-overrides”  
 1519 attribute).

1520 The “document-overrides” attribute is also useful in combination with the “pages-per-subset” ([1setOf integer](#)) [Job](#)  
 1521 [Template](#) attribute (see [pwg5100.4]) which divides up the Input Page stream concatenated across the Input  
 1522 Documents into separate Output Documents. For example, making every 10 Input Pages be a separate Output  
 1523 Document but the client only wants to staple the first Output Document, [so the client supplies a single “document-](#)  
 1524 [overrides” Job Template attribute with “finishings” that affects Output-Documents 1 only.](#) [With the removal of the](#)  
 1525 [“document-overrides” attribute, the client uses the “page-overrides” Job Template attribute to affect the stapling of](#)  
 1526 [pages 1:10 only.](#) [ISSUE 04: But what about Subset Finishing? Can we it be done without “document-overrides”?](#)

1527 Similarly, according to [pwg5100.4], the “page-overrides” (collection) attribute MAY be supplied by the client in a  
 1528 Send-Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent  
 1529 documents in the job. [\(by supplying either the “input-documents” \(1setOf rangeOfInteger \(1:MAX\)\) or the “output-](#)  
 1530 [documents” \(1setOf rangeOfInteger\) member attribute\).](#) See the “page-overrides” Job Template attribute in Table 9  
 1531 for the listing of the member attributes. However, with the introduction of the Document object, the “page-overrides”  
 1532 (collection) attribute [MUST be supplied as a Document Template attribute in the Create-Document operation and](#)  
 1533 [SHOULD be more simply supplied as one of the Document Template attributes for the document being created in the](#)  
 1534 [Send-Document or Send-URI operation and for this Document](#) only. However, [if a Printer supports the “page-](#)  
 1535 [overrides” attribute as a Document Template attribute \(in any Document Creation operations\),](#) a Printer MUST also  
 1536 support the “page-overrides” attribute as an Operation attribute [in the Send-Document and Send-URI operations](#)  
 1537 [according to \[pwg5100.4\]](#) for backward compatibility with clients that do not support the Document object.

1538 [ISSUE 05: OK that when a Printer supports Page Overrides, that we REQUIRE the Printer to continue to support the](#)  
 1539 [“page-overrides” as an operation attribute in Send-Document and Send-URI as well as a Document Template](#)  
 1540 [attribute?](#)

## 1541 6.3 Operation Attributes returned in Job and Document Creation responses

1542 Table 8 lists the Operation attributes that Printers return in Job Creation operation *responses*: Print-Job, Print-URI,  
 1543 and Create-Job and in Document Creation operation *responses*: Send-Document and Send-URI. The column  
 1544 labeled “Conformance” indicates the conformance for what the Printer returns and what the Printer supports. The  
 1545 Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1546 **Table 8 - Operation attributes returned in Job and Document Creation operation responses**

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
attributes-charset *	charset	MUST	MUST	[rfc2911] §3.1.4
	‘utf-8’	MAY	MUST	[rfc2911] §4.1.7
	‘us-ascii’	MAY	MAY	[rfc2911] §4.1.7

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
	'iso-8859-1'	MAY	MAY	[rfc2911] §4.1.7
	'iso-10646-ucs-2'	MAY	MAY	[rfc2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[rfc2911] §3.1.4
	'en-US'	MAY	MAY	[rfc2911] §4.1.8
detailed-status-message *	text	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text	MAY	MAY	[rfc2911] §3.1.6.4
document-id-uri	uri	MUST	MUST	§8.2.12
document-number	integer(1:MAX)	MUST	MUST	§8.2.19
job-id	integer(1:MAX)	MUST	MUST	[rfc2911] §4.3.2
job-uri	uri	MUST	MUST	[rfc2911] §4.3.1
redirect-uri (uri) <sup>22</sup>	uri	MAY	MAY	[not-srv] §5.2
request-id *	integer(1:32767)	MUST	MUST	[rfc2911] §3.1.2
status-code *	integer(0:32767)	MUST	MUST	[rfc2911] §3.1.6.1
status-message *	text(255)	MAY	MAY	[rfc2911] §3.1.6.2
version-number *	integer(1:255), integer(0:255)	MUST	MUST	[rfc2911] §3.1.8

1547 \* - indicates attributes that are defined for *all* operations, not just Job Creation operations  
 1548

## 1549 7 Job Template and Document Template attributes

1550 Table 9 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding  
 1551 Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the  
 1552 Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1553 A subset of these Job Template attributes (e.g., “document-format” and “media”, but not “job-priority”) are also  
 1554 defined to apply to Documents and are called Document Template attributes when supplied at the Document Level.  
 1555 Document Template attribute can be supplied in the Create-Document, Send-Document, and Send-URI operations.

1556 These Document Template attributes can also be supplied as Document Overrides using the “document-overrides”  
 1557 Job Template attribute (see [pwg5100.4]).

1558 A subset of the Document Template attributes that apply to pages (e.g., “media”, but not “document-format” or “job-  
 1559 priority”) can also be supplied as Page Overrides using the “page-overrides” Job Template collection attribute (see  
 1560 [pwg5100.4]) or as a Document Template attribute.

1561 “\*\*\*” - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job Processing  
 1562 and Document Processing attributes, respectively. However, 4 of the IPP Job Template attributes are  
 1563 represented in the PWG Semantic Model as Job Description attributes, instead of Job Processing attributes.  
 1564 These are indicated in the first column with “\*\*\*”.

<sup>22</sup> The Printer or Notification Server returns the “redirect-uri” operation attribute in order to redirect the Get-Notification operation to a Notification Server or back to the original Printer.

1565 The “Defined for use” column indicates whether the client MAY supply and the Printer support the attribute at the  
1566 Job, Document, or Page Level with the following semantics:

Supplied	Description
J=y:	Job Level: The attributes MAY be supplied as Job Template attributes at the Job Level in a Job Creation request (Print-Job, Print-URI, Create-Job) in which case each Document inherits the Job Template attribute as a default which is used unless an attribute at the document level is also supplied. Note: The “multiple-document-handling” attribute controls whether extensive attributes, such as “finishing”, “copies”, affect the entire job as a whole (‘single-xxx’ values) or affect each document separately (‘separate-xxx’ values).
D=y:	Document Level: The attribute MAY be supplied at the Document Level as Document Template attributes in a Document Creation operation (Send-Document, Send-URI), in which case the supplied Document Templates override any Job Template attributes supplied at the Job Level and any “document-overrides” supplied at the Job or Document level.
P=y:	Page Level: The attribute MAY be supplied as a member of the (1) “page-ranges” Job Template attribute at the Job Level in a Job Creation operation or (2) “page-ranges” Document Template attribute at the Document Level to affect the specified range of pages.

1567 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in  
1568 a Job Creation or Document Creation request or a Document Overrides or Page Overrides. If a Printer supports a  
1569 Job Template or Document Template attribute, then it MUST copy the supplied attribute to the Job or Document  
1570 object, respectively so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-  
1571 Document-Attributes/Get-Documents operations, respectively. The effect of Job Template Attributes supplied in Job  
1572 Creation requests are inherited by the Document objects, unless the Document Creation operation supplies the  
1573 attribute with a different value.  
1574

1575 If a Job Template collection attribute is supported (see [[eollrfc3382](#)]), then there are conformance requirements for  
1576 which member attributes MUST be supported and which member attributes a client MUST supply as indicated in the  
1577 Conformance column for each collection member attribute in Table 9.

1578 **Table 9 - Job Template and Document Template attributes**

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>copies</b>	integer(1:MAX)	y <sup>23</sup>	y	n	MAY	MAY	[rfc2911] §4.2.5

<sup>23</sup> The IPP “copies” attribute is an *extensive* attribute, so its effect when supplied at the job level is not always inherited by the documents in a multi-document job. Instead, its effect depends on the value of the “multiple-document-handling” Job Template attribute. The ‘single-document’ and ‘single-document-new-sheet’ values produce copies of the job as a whole with the multiple input documents concatenated into a single output document for each job copy. The ‘separate-document-uncollated-copies’ value produce N copies of the first input document followed by N copies of the second input document, etc. The ‘separate-document-collated-copies’ produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>cover-back</b>	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.1
<b>cover-type</b>	type2 keyword				MUST	MUST	[pwg5100.3] §3.1.2
<b>media</b>	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.1.1
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.1.1
<b>cover-front</b>	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.1
<b>cover-type</b>	type2 keyword				MUST	MUST	[pwg5100.3] §3.1.2
<b>media</b>	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.1.1
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.1.1
<b>document-overrides</b> To be removed from the next version of [pwg5100.4]	collection	y	y	n	MAY	MAY	[pwg5100.4] §5.1
<b>input-documents</b> <sup>24</sup>	1setOf rangeOfInteger(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.1.1
<b>output-documents</b>	1setOf rangeOfInteger(MAX)					MUST	[pwg5100.4] §5.1.2
<b>document-copies</b>	1setOf rangeOfInteger(MAX)				MAY	MAY	[pwg5100.4] §5.1.3
<b>document-format</b>	mimeMediaType				MAY	MUST	[pwg5100.4] §5.1.4
<b>document-name</b>	name (MAX)				MAY	MUST	[pwg5100.4] §5.1.5
<b>compression</b>	type3 keyword				MAY	MUST	[pwg5100.4] §5.1.6
<b>document-natural-language</b>	naturalLanguage				MAY	MAY	[pwg5100.4] §5.1.7
<b>page-ranges</b>	1setOf rangeOfInteger (1:MAX)				MAY	MAY	[pwg5100.4] §5.1.8
<i>any other Job Template attributes that affect documents, such as "media" or "media-col"</i>					MAY	MAY	
<b>feed-orientation</b>	type3 keyword	y	y	n	MAY	MAY	[ippsave] §5.1
<b>finishings</b>	1setOf type2 enum	y <sup>25</sup>	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "finishing-col" is supported	[rfc2911] §4.2.6 [pwg5100.1] §2
<b>finishings-col</b>	collection	y <sup>26</sup>	y	y		MAY	[pwg5100.3] §3.2
<b>finishing-template</b>	name(MAX)				MAY	MAY	[pwg5100.3] §3.2.1
<b>stitching</b>	collection				MAY	MAY	[pwg5100.3] §3.2.2
<b>stitching-reference-edge</b>	type2 keyword				MUST	MUST	[pwg5100.3] §3.2.2.1
<b>stitching-offset</b>	integer (0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.2
<b>stitching-locations</b>	1setOf integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.3
<b>font-name-requested</b>	name(MAX)	y	y	y	MAY	MAY	[ippsave] §5.2
<b>font-size-requested</b>	integer (1:MAX)	y	y	y	MAY	MAY	[ippsave] §5.3

<sup>24</sup> The Printer MUST support "document-format", "document-name", "compression", "document-natural-language", and "page-ranges" with the "input-documents" member attribute, but not with the "output-documents" member attribute.

<sup>25</sup> The IPP "finishings" and "finishings-col" attributes are *extensive* attributes, so their effect when supplied at the Job Level is not always inherited by the documents in a multi-document job. Instead, their effect depends on the value of the "multiple-document-handling" Job Template attribute. The 'single-document' and 'single-document-new-sheet' cause the finishing to be applied to each job copy as a whole. The 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values cause the finishing to be applied to each document.

<sup>26</sup> See the footnote on the "finishings" attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>force-front-side</b>	1setOf integer(1:MAX)	y <sup>27</sup>	y	y	MAY	MAY	[pwg5100.3] §3.3
<b>imposition-template</b>	type2 keyword   name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.4
<b>insert-sheet</b>	1setOf collection	y <sup>28</sup>	y	y	MAY	MAY	[pwg5100.3] §3.5
<b>insert-after-page-number</b>	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.5.1
<b>insert-count</b>	integer(0:MAX)				MAY	MUST	[pwg5100.3] §3.5.2
<b>media</b>	type3 keyword   name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.5.3
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.5.3
<b>job-account-id **</b>	name(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.6
<b>job-accounting-sheets</b>	collection	y	n	n	MAY	MAY	[pwg5100.3] §3.8
job-accounting-sheets-type	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.8.1
media	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.8.2
media-col	collection					MAY	[pwg5100.3] §3.8.2
job-accounting-output-bin	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.8.3
<b>job-accounting-user-id**</b>	name(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.7
<b>job-copies</b>	integer(1:MAX)	y	n <sup>29</sup>	n	MAY	MAY	§7.1.1

<sup>27</sup> The effect of the IPP “force-front-side” and “insert-sheet” attributes when supplied at the job level of a multi-document job depends on the value of the “multiple-document-handling” Job Template attribute. For the ‘single-document’ and ‘single-document-new-sheet’ values, the pages are numbered as a single set from 1 to n for the job as a whole. For the ‘separate-documents-collated-copies’ and ‘separate-document-uncollated-copies’ values, the pages are numbered from 1 to n for each document separately.

<sup>28</sup> See the footnote on “force-front-side”.

<sup>29</sup> The “job-copies” Job Template attribute makes copies of the entire job and MUST NOT be supplied at the Document or Page Level. The “job-copies” Job Template attribute is equivalent to “copies” with “multiple-document-handling” = ‘single-document-new-sheet’.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>job-cover-back</b> <i>same as cover-back</i>	collection see cover-back	y	n <sup>30</sup>	n	MAY	MAY	§7.1.2
<b>job-cover-front</b> <i>same as cover-front</i>	collection see cover-front	y	n <sup>31</sup>	n	MAY	MAY	§7.1.3
<b>job-error-sheet</b>	collection	y	n	n	MAY	MAY	[pwg5100.3] §3.9
<b>job-error-sheet-type</b>	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.9.1
<b>job-error-sheet-when</b>	type2 keyword				MAY	MAY	[pwg5100.3] §3.9.2
<b>media</b>	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.9.3
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.9.3
<b>job-finishings</b>	1setOf type2 enum	y	n <sup>32</sup>	n	MAY	MAY	§7.1.4
<b>job-finishings-col</b> <i>same as finishings-col</i>	collection see finishings-col	y	n <sup>33</sup>	n	MAY	MAY	§7.1.5
<b>job-hold-until</b>	type3 keyword   name(MAX)	y	n	n	MAY	MAY	[rfc2911] §4.2.2
<b>job-hold-until-time</b>	dateTime	y	n	n	MAY	MAY	[ippsave] §5.4
<b>job-message-to-operator</b>	text(MAX)	y	n <sup>34</sup>	n	MAY	MAY	[pwg5100.3] §3.10
<b>job-phone-number</b>	text(127)	y	n	n	MAY	MAY	[ippsave] §5.5
<b>job-priority</b>	integer(1:100)	y	n	n	MAY	MAY	[rfc2911] §4.2.1
<b>job-recipient-name</b> **	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.6
<b>job-save-disposition</b>	collection	y	n	n	MAY	MAY	[ippsave] §5.7
<b>save-disposition</b>	type3 keyword	y	n	n	MAY	MAY	[ippsave] §5.7.1.1
<b>save-info</b>	1setOf collection	y	n	n	MAY	MAY	[ippsave] §5.7.1.2
<b>save-location</b>	uri	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.1
<b>save-name</b>	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.2
<b>save-document-format</b>	mimeMediaType	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.3
<b>job-sheet-message</b>	text(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.12

<sup>30</sup> The “job-cover-back” Job Template attribute makes a single back cover for each job copy and MUST NOT be supplied at the Document or Page Level. The “job-cover-back” Job Template attribute is equivalent to “cover-back” with “multiple-document-handling” = ‘single-document-new-sheet’.

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

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

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

<sup>34</sup> The “job-message-to-operator” Job Template attribute has no corresponding Document Template attribute. Instead, the user and operator communicate with each other using the same “document-message” operation attribute which the Printer copies to the “document-message” Document Description attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>job-sheets</b>	type3 keyword   name(MAX)	y	n	n	MAY be neither or one of, but NOT both	MAY, MUST if "job-sheets-col" supported	[rfc2911] §4.2.3
<b>job-sheets-col</b>	collection	y	n	n		MAY	[pwg5100.3] §3.11
<b>job-sheets</b>	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.11.1
<b>media</b>	type3 keyword   name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.11.2
<b>media-col</b>	collection					MAY	[pwg5100.3] §3.11.2
<b>media</b>	type3 keyword   name(MAX)	y	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "media-col" supported	[rfc2911] §4.2.11
<b>media-col</b>	collection	y	y	y		MAY	[pwg5100.3] §3.13
<b>media-back-coating</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
<b>media-color</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.4
<b>media-front-coating</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
<b>media-grain</b>	type3 keyword   name(MAX)				MAY	MAY	[ippsave] §8.4.2
<b>media-hole-count</b>	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.6
<b>media-info</b>	text(255)				MAY	MAY	[pwg5100.3] §3.13.3
<b>media-key</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.1
<b>media-material</b>	type3 keyword   name(MAX)				MAY	MAY	[ippsave] §8.4.3
<b>media-order-count</b>	integer(1:MAX)				MAY	MAY	[pwg5100.3] §3.13.7
<b>media-preprinted</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.5
<b>media-recycled</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.11
<b>media-size</b>	collection				MAY	MUST	[pwg5100.3] §3.13.8
<b>x-dimension</b>	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.1
<b>y-dimension</b>	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.2
<b>media-size-name</b>	type3 keyword   name(MAX)				MAY	MAY	§7.1.6
<b>media-thickness</b>	integer(1:MAX)				MAY	MAY	[ippsave] §8.4.4
<b>media-tooth</b>	type3 keyword   name(MAX)				MAY	MAY	[ippsave] §8.4.1
<b>media-type</b>	type3 keyword   name(MAX)				MAY	MAY	[pwg5100.3] §3.13.2
<b>media-weight-metric</b>	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.9
<b>media-input-tray-check</b>	type3 keyword   name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.14
<b>media-size-name</b> <sup>35</sup>	type3 keyword   name(MAX)	y	y	y	MAY	MAY	§7.1.6, [upnp]
<b>media-type</b> <sup>36</sup>	type3 keyword   name(MAX)	y	y	y	MAY	MAY	[upnp], [pwg5100.3] §3.13.2

<sup>35</sup> UPnPv1 and UPnPv2 define a separate MediaSizeName Job Template attribute with values from PWG 5101.1.

<sup>36</sup> UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>multiple-document-handling</b>	type2 keyword	y	n	n	MAY	MUST if multiple document jobs supported	[rfc2911] §4.2.4
<b>number-up</b>	integer(1:MAX)	y	y	y	MAY	MAY	[rfc2911] §4.2.9
<b>orientation-requested</b>	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.10
<b>output-bin</b>	type2 keyword   name(MAX)	y	n	n	MAY	MAY	[pwg5100.2] §2.1
<b>page-delivery</b>	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.15
<b>page-order-received**</b>	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.16
<b>page-overrides</b>	1setOf collection	y <sup>37</sup>	y	n	MAY	MAY	[pwg5100.4] §5.2
<b>input-documents</b>	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.2.1
<b>output-documents</b>	1setOf rangeOfInteger(1:MAX)					MUST	[pwg5100.4] §5.2.2
<b>document-copies</b>	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[pwg5100.4] §5.2.3
<b>pages</b>	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[pwg5100.4] §5.2.4
<i>any other Job Template attributes that affect pages, such as "media" or "media-col"</i>					MAY	MAY	
<b>page-ranges</b>	1setOf rangeOfInteger(1:MAX)	y	y	n	MAY	MAY	[rfc2911] §4.2.7
<b>pages-per-subset</b>	1setOf integer(1:MAX)	y <sup>38</sup>	n	n	MAY	MAY	[pwg5100.3] §5.3
<b>pdl-init-file</b>	1setOf collection	y	y	n	MAY	MAY	[ippsave] §5.8
<b>pdl-init-file-location</b>	uri				MAY	MAY	[ippsave] §5.8.1.1
<b>pdl-init-file-name</b>	name(MAX)				MAY	MAY	[ippsave] §5.8.1.2
<b>pdl-init-file-entry</b>	name(MAX)				MAY	MAY	[ippsave] §5.8.1.3
<b>presentation-direction-number-up</b>	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.17
<b>print-quality</b>	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.13
<b>printer-resolution</b>	resolution	y	y	y	MAY	MAY	[rfc2911] §4.2.12
<b>proof-print</b>	collection	y	n	n	MAY	MAY	[ippsave] §5.9
<b>proof-print-copies</b>	integer (0:MAX)	y	n	n	MAY	MAY	[ippsave] §5.9.1.1
<b>media</b>	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[ippsave] §5.8.1.2
<b>media-col</b>	collection					MAY	[ippsave] §5.8.1.2

<sup>37</sup> The effect of the IPP "page-overrides" Job Template attribute when supplied at the job level of a multi-document job depends on the value of the "multiple-document-handling" Job Template attribute. For the 'single-document' and 'single-document-new-sheet' values, the pages are numbered as a single set from 1 to n for the job as a whole. For the 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values, the pages are numbered from 1 to n for each document separately.

<sup>38</sup> The IPP "pages-per-subset" Job Template attribute MUST be supplied at the Job Level and can only be used when the "multiple-document-handling" Job Template attribute is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copes', since the purpose of the "pages-per-subset" attribute is to produce separate output documents for each subset. Otherwise, the Printer MUST ignore the "pages-per-subset" attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
<b>separator-sheets</b>	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.18
separator-sheets-type	type3 keyword   name(MAX)				MUST	MUST	[pwg5100.3] §3.18.1
media	type3 keyword   name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.18.2
media-col	collection					MAY	[pwg5100.3] §3.18.2
<b>sheet-collate</b>	type2 keyword	y	y	n	MAY	MAY	[rfc3381] §3.1
<b>sides</b>	type2 keyword	y	y	y	MAY	MAY	[rfc2911] §4.2.8
<b>x-image-position</b>	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.2
<b>x-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.3
<b>x-side1-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.4
<b>x-side2-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.5
<b>y-image-position</b>	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.6
<b>y-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.7
<b>y-side1-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.8
<b>y-side2-image-shift</b>	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.9

1579 “\*\*” - These 4 attributes are Job Description attributes, not Job Processing attributes in the PWG Semantic Model -  
 1580 see Legend before the Table.

## 1581 7.1 Job Template attributes defined for use with multi-document jobs

1582 This section defines additional Job Template attributes for use with the Document object.

### 1583 7.1.1 job-copies (integer(1:MAX))

1584 This attribute specifies the number of job copies, i.e., with all of the Document objects taken together. Its  
 1585 interpretation is independent of the value of the “multiple-document-handling” Job Template attribute. See the  
 1586 “copies” Job Template attribute defined in [rfc2911] section 4.2.5 which switches between job copies and document  
 1587 copies depending on the value of the “multiple-document-handling” Job Template attribute.

### 1588 7.1.2 job-cover-back (collection)

1589 This attribute specifies the cover for the back of the job, i.e., with all of the Document objects taken together and is  
 1590 independent of the value of the “multiple-document-handling” Job Template attribute. The member attributes are the  
 1591 same as “cover-back” (see [pwg5100.3] section 3.1). However, the “cover-back” Job Template attribute switches  
 1592 between a job back cover and a document back cover depending on the value of the “multiple-document-handling”  
 1593 Job Template attribute.

### 1594 7.1.3 job-cover-front (collection)

1595 This attribute specifies the cover for the front of the job, i.e., with all of the Document objects taken together and is  
1596 independent of the value of the “multiple-document-handling” Job Template attribute. The member attributes are the  
1597 same as the “cover-front” Job Template attribute (see [pwg5100.3] section 3.2). However, the “cover-front” Job  
1598 Template attribute switches between a job front cover and a document front cover depending on the value of the  
1599 “multiple-document-handling” Job Template attribute.

### 1600 7.1.4 job-finishings (1setOf type2 enum)

1601 This attribute specifies the job finishings, i.e., with all of the Document objects taken together. Its interpretation is  
1602 independent of the value of the “multiple-document-handling” Job Template attribute. See the “finishings” Job  
1603 Template attribute defined in [rfc2911] section 4.2.6 which switches between job finishings and document finishings  
1604 depending on the value of the “multiple-document-handling” Job Template attribute.

### 1605 7.1.5 job-finishings-col (1setOf collection)

1606 This attribute specifies the job finishings collection, i.e., with all of the Document objects taken together. Its  
1607 interpretation is independent of the value of the “multiple-document-handling” Job Template attribute. See the  
1608 “finishings” Job Template attribute defined in [rfc2911] section 4.2.6 which switches between job finishings collection  
1609 and document finishings collection depending on the value of the “multiple-document-handling” Job Template  
1610 attribute.

### 1611 7.1.6 media-size-name (type3 keyword | name(MAX))

1612 This Job Template and Document Template attribute specifies the name of a size of media. The values are defined  
1613 in [pwg5101.1]. The attribute is used in [upnp] as a Job Template attribute.

1614 The “media-size-name” attribute is also defined as a member attribute of the “media-col” Job Template (see  
1615 [pwg5100.3] section 3.13) and Document Template attribute. Examples:

1616           ‘na\_letter\_8.5x11in’ - The letter size (8.5 inches by 11 inches) used in North America.

1617           ‘iso\_a4\_210x297mm’ - The iso A4 size (210 mm by 297 mm) used in metric countries.

### 1618 7.1.7 media-type (type3 keyword | name(MAX))

1619 This Job Template and Document Template attribute specifies the type of media. The values are defined in  
1620 [pwg5101.1] and [pwg5100.3] section 3.13.2. The attribute is used in [upnp] as a Job Template attribute.

1621 The “media-type” attribute is also defined as a member attribute of the “media-col” Job Template (see [pwg5100.3]  
1622 section 3.13.2) and Document Template attribute. Examples:

1623           ‘stationery’ - Separately cut sheets of an opaque material.

1624           ‘transparency’ - Separately cut sheets of a transparent material

1625

## 1626 7.2 Document Template attributes

1627 Most Job Template attributes can be used as Document Template attributes for use in Document Creation  
1628 operations to apply to the Document object. However, the Job Template attributes that have the “job-“ prefix MUST  
1629 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 9 shows  
1630 lists all of the Document Template attributes for use with the Document Creation operations and the Document  
1631 object. All of the definitions of the Document Template attributes are done by reference to the corresponding Job  
1632 Template attributes in other specifications. However, the semantics of each Document Template attribute only  
1633 applies to the Document object with which the attribute is associated either by being supplied by the client in the

1634 Document Creation operation or supplied by the Printer as a default because the client did not (and the PDL did not  
1635 have any corresponding instruction). See section 5 for defaulting semantics.

## 1636 8 Job Description and Document Description attributes

1637 Table 10 lists all the Job Description defined in other IPP specifications and the corresponding Document Description  
1638 attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and  
1639 Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute  
1640 values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes  
1641 as flagged with “”. Unless specified otherwise herein, the Printer MUST NOT support modification of Job Description  
1642 and Document Descriptions attributes.

1643 The column labeled “attribute syntax” indicates the attribute syntax (see [rfc2911] section 4.1). The Printer  
1644 conformance is indicated along with the reference to the specification in which the attribute is defined. The  
1645 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the  
1646 corresponding Job Description attributes.

1647 Each of the Document Description attributes have a sub-section in section 8.2. The column labeled References  
1648 column contains references to the sub-section in this document if there is significant information there. Those  
1649 subsections that are only references to other specifications contain only that reference in the Reference column.  
1650 Those attributes that are only Job Description attributes with no subsection in this specification have a “n/a” in the  
1651 “Doc Desc” column.

1652 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an  
1653 object with a state and it cannot be queried.

1654 Legend:

1655 **[job-]** indicates an attribute that shouldn't have had a “job-” prefix in its name in [rfc2911], so that the same attribute  
1656 name could also be used for the Document object as a Document Description attribute. Note: For the PWG  
1657 Semantic Model, the “job-” prefix is dropped.

1658 “-” indicates that the Job or Document attribute is *not* defined.

1659 “\*” indicates a Job and/or Document Description attribute that the client MAY supply the values for in a  
1660 corresponding Operation attribute<sup>39</sup> in a Job or Document Creation operation. See Table 6 for the  
1661 corresponding Operation attribute.

1662 (r/w) indicates that the Job Description or Document Description attribute is read/write, so that the client can  
1663 changes its value using the Set-Job-Attributes or Set-Docment-Attributes operation (see section 3.7).

1664

**Table 10 - Job and Document Description attributes**

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
<b>attributes-charset *</b>	charset	y	y	MUST	[rfc2911] §4.3.19	§8.2.1
<b>attributes-natural-language *</b>	naturalLanguage	y	y	MUST	[rfc2911] §4.3.20	§8.2.2
<b>compression *</b>	type3 keyword	-	y	MUST	[rfc2911] §3.2.1.1	§8.2.3
<b>current-page-order</b>	type2 keyword	y	y	MAY	[pwg5100.3] §4.1	§8.2.4
<b>date-time-at-completed</b>	dateTime	y	y	MAY	[rfc2911] §4.3.14.7	§8.2.5
<b>date-time-at-creation</b>	dateTime	y	y	MAY	[rfc2911] §4.3.14.5	§8.2.6

<sup>39</sup> Document Description attributes that the client can supply in a Job or Document operation as operation attributes (indicated with \*\*) comprise *all* of the Document Description attributes in the PWG Semantic Model ([pwgsm]). Those Document Description attributes that clients cannot supply values correspond to Document Status attributes in the PWG Semantic Model.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference	
					Job Description Attr	Doc Desc.
<b>date-time-at-processing</b>	dateTime	y	y	MAY	[rfc2911] §4.3.14.6	§8.2.7
<b>document-format *</b>	mimeMediaType	-	y	MUST	[rfc2911] §3.2.1.1	§8.2.8
<b>document-format-details-container-summary *</b>	1setOf collection	-	y	MAY <sup>40</sup>	(new)	§8.2.9
<b>document-creator-application-name *</b>	name(MAX)	-	y	MAY	(new)	§6.1.2.1
<b>document-creator-application-version *</b>	text(127)	-	y	MAY	(new)	§6.1.2.2
<b>document-creator-os-name *</b>	name(40)	-	y	MAY	(new)	§6.1.2.3
<b>document-creator-os-version *</b>	text(40)	-	y	MAY	(new)	§6.1.2.4
<b>document-format *</b>	mimeMediaType	-	y	MUST	(new)	§6.1.2.5
<b>document-format-device-id *</b>	text(127)	-	y	MUST	(new)	§6.1.2.6
<b>document-format-version *</b>	text(127)	-	y	MAY	(new)	§6.1.2.7
<b>document-natural-language *</b>	naturalLanguage	-	y	MAY	(new)	§6.1.2.8
<b>document-format-details-detected</b>	1setOf collection	-	y	MAY	(new)	§8.2.10
<b>document-format-detected</b>	mimeMediaType	-	y	MAY	(new)	§8.2.11
<b>document-id-uri</b>	uri	-	y	MUST	(new)	§8.2.12
<b>document-job-id</b>	integer(1:MAX)	-	y	MUST	(new)	§8.2.13
<b>document-job-printer-uri</b>	uri	-	y	MUST	(new)	§8.2.14
<b>document-job-uri</b>	uri	-	y	MUST	(new)	§8.2.15
<b>document-message *(r/w)</b>	text(MAX)	- <sup>41</sup>	y	MAY	(new)	§8.2.16
<b>document-name *(r/w)</b>	name(MAX)	-	y	MUST	[rfc2911] §3.2.1.1	§8.2.17
<b>document-natural-language *</b>	naturalLanguage	-	y	MAY	[rfc2911] §3.2.1.1	§8.2.18
<b>document-number</b>	integer(0:MAX)	-	y	MUST	(new)	§8.2.19
<b>document-state</b>	type1 enum	-	y	MUST	(new)	§8.2.20
<b>document-state-message</b>	text(MAX)	-	y	MAY	(new)	§8.2.21
<b>document-state-reasons</b>	1setOf type2 keyword	-	y	MUST	(new)	§8.2.22
<b>document-uri *</b>	uri	-	y	MAY	(new)	§8.2.23
<b>impressions-completed-current-copy</b>	integer(0:MAX)	y	y	MAY	[rfc3381] §4.4	§8.2.24
<b>ipp-attribute-fidelity *</b>	boolean	y	-	MUST	[rfc2911] §3.2.1.1	§8.1.1
<b>job-collation-type</b>	type2 enum	y	-	MAY	[rfc3381] §4.1	n/a
<b>job-detailed-status-message</b>	1setOf text (MAX)	y	y	MAY	[rfc2911] §4.3.10	§8.2.25
<b>job-document-access-errors</b>	1setOf text(MAX)	y	y	MAY	[rfc2911] §4.3.11	§8.2.26
<b>job-impressions *</b>	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.17.2	§8.2.27
<b>job-impressions-completed</b>	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.2	§8.2.28

<sup>40</sup> The “document-container-summary” Document Description attribute MUST be supported by a Printer that supports a container MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

<sup>41</sup> The “document-message” (text(127)) Document Description attribute has a corresponding “job-message-from-operator” (text(127)) Job Description attribute (see [rfc2911] section 4.3.16) which handles operator to user communication only and a “job-message-to-operator (text(MAX)) Job Template attribute (see [pwg5100.3] section 3.10) for user to operator communication.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference	
					Job Description Attr	Doc Desc.
<b>[job-]k-octets *</b>	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.17.1	§8.2.29
<b>[job-]k-octets-processed</b>	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.1	§8.2.30
<b>job-mandatory-attributes *</b>	1setOf type2 keyword	y	-	<del>MAY</del> MUST <sup>42</sup>	(new)	§8.1.2
<b>[job-]media-sheets *</b>	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.17.3	§8.2.31
<b>[job-]media-sheets-completed</b>	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.3	§8.2.32
<b>job-message-from-operator</b>	text(127)	y	- <sup>43</sup>	MAY	[rfc2911] §4.3.16	n/a
<b>[job-]more-info</b>	uri	y	y	MAY	[rfc2911] §4.3.4	§8.2.33
<b>job-name *(r/w)</b>	name(MAX)	y	- <sup>44</sup>	MUST	[rfc2911] §4.3.5	n/a
<b>job-originating-user-name</b>	name (MAX)	y	-	MUST	[rfc2911] §4.3.6	n/a
<b>job-password *</b>	octetString(255)	y	-	MAY	[ippsave] §4.1	n/a
<b>job-password-encryption *</b>	type3 keyword   name(MAX)	y	-	MAY	[ippsave] §4.2	n/a
<b>job-printer-make-and-model</b>	text(127)	y	-	CMUST <sup>45</sup>	[rfc2911] §4.3.14.4	n/a
<b>[job-]printer-up-time</b>	integer (1:MAX)	y	y	MUST	[rfc2911] §4.3.14.4	§8.2.34
<b>job-state</b>	type1 enum	y	- <sup>46</sup>	MUST	[rfc2911] §4.3.7	§8.2.20
<b>job-state-message</b>	text(MAX)	y	- <sup>47</sup>	MAY	[rfc2911] §4.3.9	§8.2.21
<b>job-state-reasons</b>	1setOf type2 keyword	y	- <sup>48</sup>	MUST	[rfc2911] §4.3.8	§8.2.22
<b>[job-]warnings-count</b>	integer(0:MAX)	y	y	MAY	[pwg5100.4] §6.1	§8.2.35
<b>last-document *</b>	boolean	-	y	MAY	[rfc2911] §4.3.12	§8.2.36
<b>number-of-documents</b>	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.15	n/a
<b>number-of-intervening-jobs</b>	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.13	n/a
<b>output-device-assigned</b>	name(127)	y	y	MAY	[rfc2911] §4.3.7.2	§8.2.37
<b>sheet-completed-copy-number</b>	integer(0:MAX)	y	y	MAY	[rfc3381] §4.2	§8.2.38
<b>sheet-completed-document-number</b>	integer(0:MAX)	y	-	MAY	[rfc3381] §4.3	n/a
<b>time-at-completed</b>	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.3	§8.2.39
<b>time-at-creation</b>	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.1	§8.2.40
<b>time-at-processing</b>	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.2	§8.2.41

<sup>42</sup> **ISSUE 03 (repeat):** Should we make “job-mandatory-attributes” a REQUIRED attribute for a Printer to support (if it supports the Document object)? Otherwise, clients won’t support it and will be stuck with the “ipp-attribute-fidelity” attribute?

<sup>43</sup> The “job-message-from-operator” Job Description attribute has no corresponding “document-message-from-operator” (text(127)) Document Description attribute. Instead, both the user and the operator use the “document-message” (text(127)) operation/Document Description attribute (see section 8.2.16) to communicate with each other.

<sup>44</sup> The Document Description attribute that corresponds to the “job-name” Job Description attribute is the (existing) “document-name” attribute defined in [rfc2911].

<sup>45</sup> The “job-printer-make-and-model” Job Description attribute MUST be supported if the “job-save-disposition” Job Template attribute is supported.

<sup>46</sup> The Document Description attribute that corresponds to the “job-state” Job Description attribute is the (new) “document-state” attribute.

<sup>47</sup> The Document Description attribute that corresponds to the “job-state-message” Job Description attribute is the (new) “document-state-message” attribute.

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

1665 "" See the description in the Legend before the table.

1666

1667 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to  
 1668 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and  
 1669 Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing,  
 1670 formatting processes as well. The job state reasons have a number of reasons that are print service specific, but  
 1671 most can apply to other types of service as well. The reason for separating state from reasons, is so that the states  
 1672 can be the fundamental states that most implementations have, while the state reasons can vary depending on the  
 1673 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state  
 1674 reasons are more information, both for programs and people.

1675 The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the  
 1676 existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid  
 1677 understanding and implementation and so that future maintenance will continue this strong parallelism. The "/"  
 1678 character separates the words: Job from Document so that the same description can serve for both Job and  
 1679 Document objects.

## 1680 8.1 Job Description attributes

1681 This sub-section contains ~~only~~ the Job Description attributes that ~~are defined in this specification and~~ are not defined  
 1682 in any other specification.

### 1683 8.1.1 ipp-attribute-fidelity (boolean)

1684 This REQUIRED Job Description attribute indicates the value of the corresponding "ipp-attribute-fidelity" Operation  
 1685 attribute ([rfc2911] section 3.2.1.1)<sup>49</sup> that the client supplied in the Job Creation operation. This Job Description  
 1686 attribute has no effect on the processing of the job once the Job Creation and Document Creation operations have  
 1687 been accepted. However, this attribute does provide an audit capability to the user and service desk for comparing  
 1688 unexpected printed results with what was submitted.

### 1689 8.1.2 job-mandatory-attributes (1setOf type2 keyword)

1690 ~~ISSUE 03 repeat: Should we make "job-mandatory-attributes" a REQUIRED attribute for a Printer to support (if it~~  
 1691 ~~supports the Document object)? Otherwise, clients won't support it and will be stuck with the "ipp-attribute-fidelity"~~  
 1692 ~~attribute?~~

1693 This ~~OPTIONAL~~ REQUIRED<sup>50</sup> Job Description attribute indicates which Job Template and Document Template  
 1694 attributes that the client required that the Printer ~~honor~~ Honor in order to accept the Job Creation and subsequent  
 1695 Document Creation requests. The Printer populates this attribute with the value of the corresponding "job-  
 1696 mandatory-attributes" Operation attribute (see section 4.4.2) supplied by the client in the Job Creation operation.  
 1697 This Job Description attribute has no effect on the processing of the job once the Job Creation and Document  
 1698 Creation operations have been accepted. However, this Document Description attribute does provide an audit  
 1699 capability of the Job object in the Job History (see [rfc2911] section 4.3.7.2) to the user and service desk for  
 1700 comparing unexpected printed results with what was submitted. See section 4.4.2 for additional details of the  
 1701 semantics of the "job-mandatory-attributes" operation/Document Description attribute that are not repeated here.

<sup>49</sup> The "ipp-attribute-fidelity" attribute is defined as an operation attribute only in [RFC2911]. This specification is defining it as a Document Description attribute which the Printer MUST support.

<sup>50</sup> The "job-mandatory-attributes" Job Description attribute is REQUIRED for conformance to this Document Object specification. It is not REQUIRED for conformance to any other specification. See the definition of REQUIRED in section 2.1.

## 1702 8.2 Document Description attributes

1703 This section contains *all* of the Document Description attributes for use with the Document object. Most of these  
1704 definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the  
1705 semantics of each Document Description attribute only applies to the Document object containing the Document  
1706 Description attribute.

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

### 1707 8.2.1 attributes-charset (charset)

1708 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
1709 attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description  
1710 attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see  
1711 section 3.1).

### 1712 8.2.2 attributes-natural-language (naturalLanguage)

1713 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
1714 attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description  
1715 attribute from the corresponding Operation attribute supplied by the client in the Document Creation operation (see  
1716 section 3.1).

### 1717 8.2.3 compression (type3 keyword)

1718 This REQUIRED Document Description attribute specifies the compression used to represent this document (see  
1719 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute  
1720 supplied by the client in the Document Creation operation (see section 3.1).

### 1721 8.2.4 current-page-order (type2 keyword)

1722 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1723 attribute (see [pwg5100.3] §4.1) applied to the Document object.

### 1724 8.2.5 date-time-at-completed (dateTime)

1725 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1726 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

### 1727 8.2.6 date-time-at-creation (dateTime)

1728 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1729 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

### 1730 8.2.7 date-time-at-processing (dateTime)

1731 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
1732 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

1733 **8.2.8 document-format (mimeMediaType)**

1734 This REQUIRED Document Description attribute is a copy of the corresponding “document-format” Operation  
 1735 attribute (see section 6.1.1) that the client supplied in the Document Creation operation. This attribute specifies the  
 1736 document format (see [rfc2911] §3.2.1.1) for the Document object. The standard values for this attribute are Internet  
 1737 Media types (sometimes called MIME types). For further details see the description of the 'mimeMediaType' attribute  
 1738 syntax in [rfc2911] section 4.1.9. ~~If it is a MIME Media Type, such as ‘multipart/related’ or ‘application/zip’, that is a~~  
 1739 ~~container format that contains document parts, the~~ “document-format-details-container-summary” attribute  
 1740 summarizes the content (see section 8.2.9) whether the “document-format” is a single document format or a  
 1741 container document format, such as “multipart/related” or ‘application/zip’. The Printer sets this Document  
 1742 Description attribute from the corresponding Operation attribute supplied by the client in the Document Creation  
 1743 operation (see section 3.1).

1744 **8.2.9 document-format-details-container-summary (1setOf collection)**

1745 This OPTIONAL Document Description attribute is a copy of the summarizes the corresponding “document-format-  
 1746 details” Operation attribute (see section 6.1.2) that the client supplied in the Document Creation operation. See  
 1747 section 6.1.2 for the full semantics of the attribute (and its member attributes) which are not duplicated here.  
 1748 document format content of the body parts, if the document’s document format is a container type, such as  
 1749 ‘multipart/related’ or ‘application/zip’. If a Printer supports the “document-format-details” Operation attributes such a  
 1750 container MIME type, the Printer MUST support this “document-format-details-container-summary” Document  
 1751 Description attribute ~~and all the member attributes in Table 10 that the Printer supports as top-level Document~~  
 1752 ~~Description attributes.~~ The purpose of the “document-format-details-container-summary” Document Description  
 1753 attribute is to allow a receiving Printer to determine whether or not it supports all of record the exact expected  
 1754 document format or formats and its details in the supplied instance of the container Document object, including the  
 1755 container format itself.

1756 **8.2.10 document-format-details-detected (1setOf collection)**

1757 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format  
 1758 details of the Document object. Before the document format details are known, the Printer populates this attribute  
 1759 member attributes that each contain a zero length string. As the Printer processes the Document object, the Printer  
 1760 populates this attribute with the actual values detected<sup>51</sup> whether or not the client supplied a “document-format-  
 1761 details” Operation attribute in the Document Creation operation. This value will differ from the value submitted by the  
 1762 client, if the Printer automatically senses the document format details by examining the document content, such as  
 1763 when the “document-format” attribute has the value: ‘application/octet-stream’ (see [rfc2911] section 4.1.9.1).

1764 **8.2.11 document-format-detected (mimeMediaType)**

1765 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format of  
 1766 the Document object. This value will differ from the value submitted by the client or defaulted by the Printer, if the  
 1767 Printer automatically senses the document format by examining the document content, such as when the “document-  
 1768 format” attribute has the value: ‘application/octet-stream’ (see [rfc2911] section 4.1.9.1). Before the document format  
 1769 is known, the Printer populates this attribute with a zero length string.

1770 **8.2.12 document-id-uri (uri)**

1771 This REQUIRED Document Description attribute is generated by the Printer as a unique URI to identify a Document  
 1772 object, in the same way that the “job-uri” (uri) Job Description attribute uniquely identifies a Job object. Unlike the  
 1773 “job-uri” (uri) (see [rfc2911] section 4.3.1) attribute and “document-job-uri” (uri) (see §8.2.15), the client cannot supply  
 1774 this attribute as a target of any operation. Example: ipp://www.company.com/printers/myprinter/jobs/22/doc3.

<sup>51</sup> The “document-format-details-detected” is not named “document-format-details-actual”, since it is tracking an operation attribute, not a Job or Document Template attribute (same as “document-format-detected”).

1775 **8.2.13 document-job-id (integer(1:MAX))**

1776 This REQUIRED Document Description attribute is a *copy* of the Job's "job-id" Job Description attribute (see  
1777 [rfc2911] §4.3.2), i.e., the "job-id" of the Job containing this Document.

1778 **8.2.14 document-job-printer-uri (uri)**

1779 This REQUIRED Document Description attribute is a *copy* of the Job's "job-printer-uri" Job Description attribute (see  
1780 [rfc2911] §4.3.3), i.e., the URI of the Printer containing the Job which contains this Document. Example:  
1781 `ipp://www.company.com/printers/myprinter.`

1782 **8.2.15 document-job-uri (uri)**

1783 This REQUIRED Document Description attribute is a *copy* of the Job's "job-uri" Job Description attribute (see  
1784 [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:  
1785 `ipp://www.company.com/printers/myprinter/jobs/22`

1786 **8.2.16 document-message (text(MAX))**

1787 This OPTIONAL Document Description contains a message from either (1) the user to the operator about the  
1788 Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the  
1789 reasons for modification or other management action taken on the Document. The Printer populates this Document  
1790 Description attribute from the "document-message" (text(MAX)) Operation attribute value supplied by the client in any  
1791 of the Document Creation operations (see section 3.1.1) or in a Cancel-Document operation (see section 3.8).

1792 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-  
1793 Document-Attributes operation (see section 3.7).

1794 **8.2.17 document-name (name(MAX))**

1795 This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1). The  
1796 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in  
1797 the Document Creation operation (see section 3.1).

1798 This attribute may be modified by a client using the Set-Document-Attributes operation (see section 3.7).

1799 **8.2.18 document-natural-language (naturalLanguage)**

1800 This OPTIONAL Document Description attribute specifies the natural language of the document (see [rfc2911]  
1801 §3.2.1.1 and [pwg5100.4] §5.1.7). *If the document contains more than one language, the value is the first or primary*  
1802 *language of the document.* The Printer sets this Document Description attribute from the corresponding Operation  
1803 attribute supplied by the client in the Document Creation operation (see section 3.1). The Printer MAY use this value  
1804 to select fonts or other Globalization processing.

1805 *ISSUE 13: The definition in [rfc2911] §3.2.1.1 and [pwg5100.4] §5.1.7 is single-valued. OK that this document*  
1806 *attribute isn't 1setOf? Or should we extend "document-natural-language" to 1setOf naturalLanguage) and keep the*  
1807 *same name? Or change the name to "document-natural-languages"?*

1808 **8.2.19 document-number (integer(1:MAX))**

1809 This REQUIRED Document Description attribute is the ordinal number of the document within the job which  
1810 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically  
1811 increasing from 1 for each job.

1812 **8.2.20 document-state (type1 enum) and job-state (type1 enum)**

1813 The REQUIRED "job-state" and the REQUIRED "document-state" Document Description attributes identify the  
 1814 current state of the job and document, respectively. Even though IPP defines seven values for job/document states  
 1815 (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1), implementations only need to support those states  
 1816 which are appropriate for the particular implementation. In other words, an IPP Printer object implementation  
 1817 supports only those job/document states implemented by the output device and available to the IPP Printer object  
 1818 implementation.

1819 Table 11 lists the "job-state" and "document-state" attribute values.

1820 **Table 11 - "job-state" and "document-state" attribute values**

Values	"job-state"	"document-state"
3 pending	y	y
4 pending-held	y	n/a
5 processing	y	y
6 processing-stopped	y	n/a
7 canceled	y	y
8 aborted	y	y
9 completed	y	y

1821

1822 The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state"  
 1823 attributes or just the "job-state" attribute as indicated in Table 11. Standard enum values are:

Value	Symbolic Name and Description
'3'	<b>'pending'</b> (JD): The job is a candidate to start processing, but is not yet processing. The document has not started to be processed at all.
'4'	<b>'pending-held'</b> (J): The job is not a candidate for processing for any number of reasons but will return to the 'pending' state as soon as the reasons are no longer present. The job's "job-state-reason" attribute MUST indicate why the job is no longer a candidate for processing. The 'pending-held' state does not apply to the Document object's "document-state" attribute.
'5'	<b>'processing'</b> (JD): One or more of: <ol style="list-style-type: none"> <li>1. The job is using, or is attempting to use, one or more purely software processes that are analyzing, creating, or interpreting a PDL, etc.,</li> <li>2. The job is using, or is attempting to use, one or more hardware devices that are interpreting a PDL, making marks on a medium, and/or performing finishing, such as stapling, etc.,</li> <li>3. The Printer object has made the job ready for printing, but the output device is not yet printing it, either because the job hasn't reached the output device or because the job is queued in the output device or some other spooler, awaiting the output device to print it.</li> </ol>

When the job is in the 'processing' state, the entire job/document state includes the detailed status represented in the Printer object's "printer-state", "printer-state-reasons", and "printer-state-message" attributes.

On the other hand, the 'processing' state for the Document indicates that the Document has begun to be processed. Even if the job stops being processed, the Document remains in the 'processing' state until it moves to one of the three terminal states.

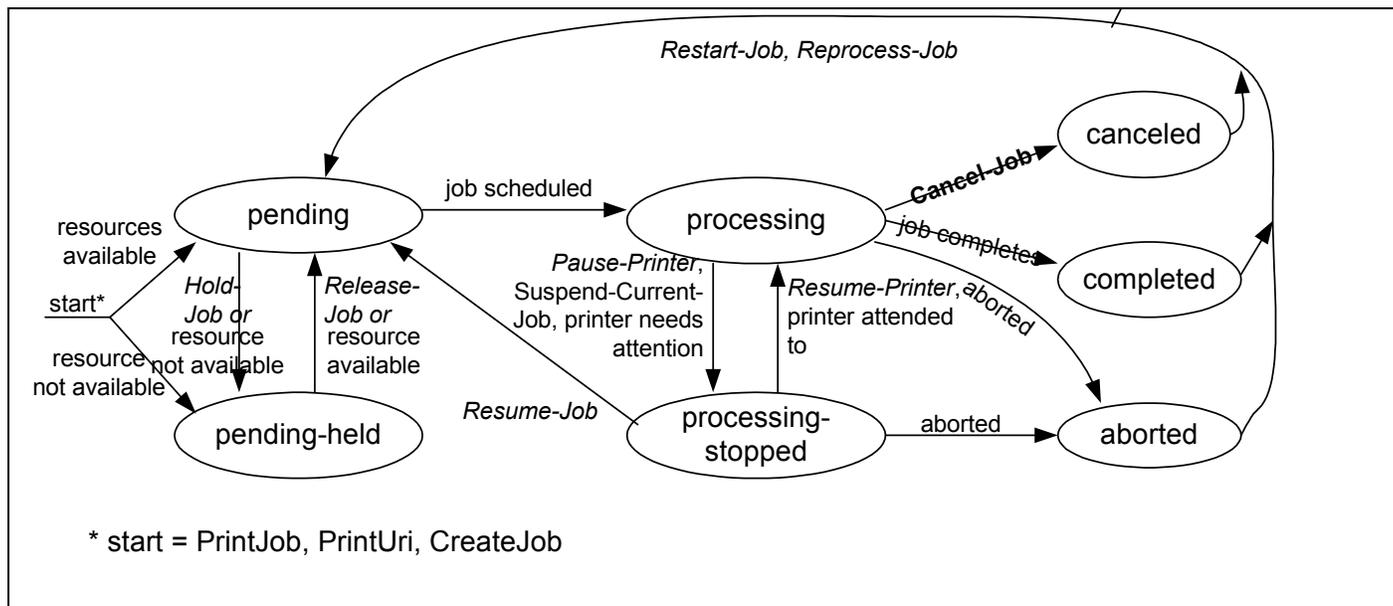
Value	Symbolic Name and Description
'6'	<p>Implementations MAY, <del>though they NEED NOT,</del> include additional values in the job's/document's "job-state-reasons"/"document-state-reasons" attribute to indicate the progress of the job/document, such as adding the 'job-printing'/ 'printing' value to indicate when the output device is actually making marks on paper and/or the 'processing-to-stop-point' value to indicate that the Printer is in the process of canceling or aborting the job/document. Most implementations won't bother with this nuance.</p> <p><b>'processing-stopped'</b> (J): The job has stopped while processing for any number of reasons and will return to the 'processing' state as soon as the reasons are no longer present.</p> <p>The job's "job-state-reason" attribute MAY indicate why the job has stopped processing. For example, if the output device is stopped, the 'printer-stopped' value MAY be included in the job's "job-state-reasons" attribute.</p> <p>Note: When an output device is stopped, the device usually indicates its condition in human readable form locally at the device. A client can obtain more complete device status remotely by querying the Printer object's "printer-state", "printer-state-reasons" and "printer-state-message" attributes.</p>
'7'	<p>The 'processing-stopped' state does not apply to the Document object's "document-state" attribute.</p> <p><b>'canceled'</b> (JD): The job/document has been canceled by a Cancel-Job/Cancel-Document operation and the Printer object has completed canceling the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer object is canceling the job/document, the job/document remains in its current state, but the job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' value and one of the 'canceled-by-user', 'canceled-by-operator', or 'canceled-at-device' value. When the job/document moves to the 'canceled' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'canceled-by-xxx', if present, MUST remain.</p>
'8'	<p><b>'aborted'</b> (JD): The job/document has been aborted by the system, usually while the job/document was in the 'processing' or 'processing-stopped' state and the Printer has completed aborting the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer object is aborting the job/document, the job/document remains in its current state, but the job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values. When the job/document moves to the 'aborted' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'aborted-by-system' value, if present, MUST remain.</p>
'9'	<p><b>'completed'</b> (JD): The job/document has completed successfully or with warnings or errors after processing and all of the job/document media sheets have been successfully stacked in the appropriate output bin(s) and all job/document status attributes have reached their final values for the job/document. The job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.</p>

1824 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the  
1825 job/document altogether. The length of time that jobs/document remain in the 'canceled', 'aborted', and 'completed'  
1826 states depends on implementation.

1827 Jobs/documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the jobs/documents  
 1828 have completed all activity, including stacking output media, after the jobs/documents have completed all activity,  
 1829 and all job/document status attributes have reached their final values for the job/document.

1830 **8.2.20.1 The “job-state” Job Description attribute and the Job Life Cycle**

1831 The “job-state” attribute is one of the most important Job Description attributes. Figure 1 shows the values of the  
 1832 “job-state” attribute and the Job object life cycle as affected by actions on the Job, Printer, and job processing.



1833

1834 **Figure 1 - The “job-state” Job Description attribute and the Job object life cycle**

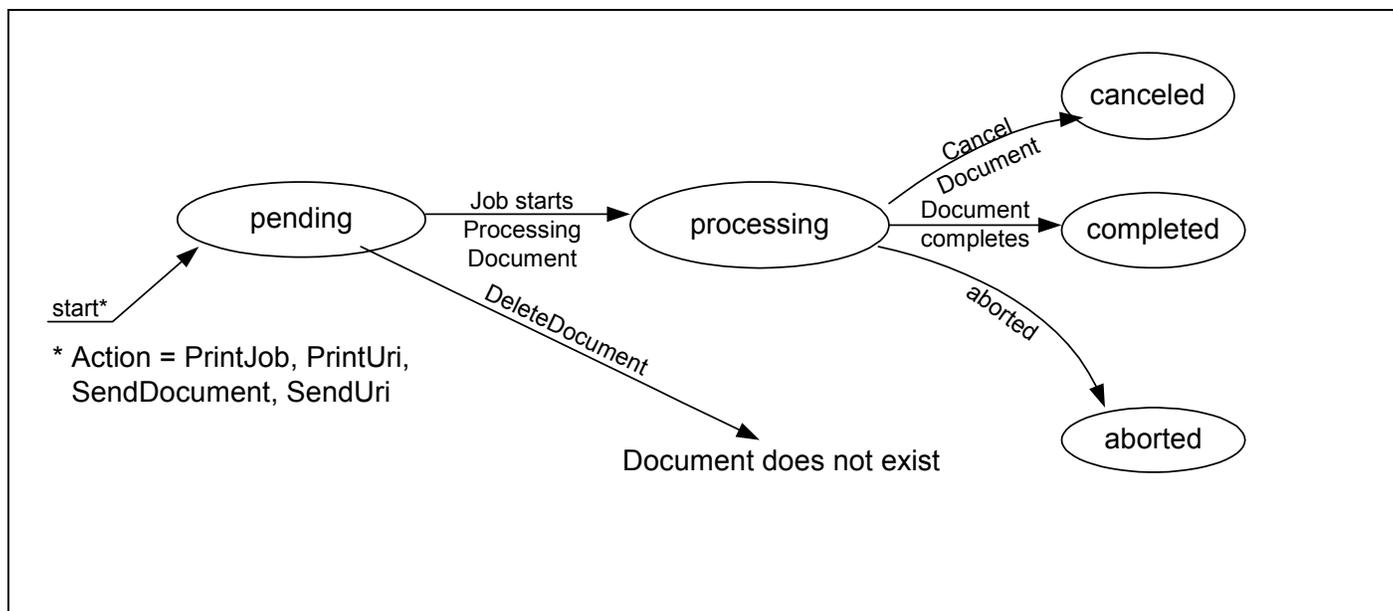
1835 Normally a job progresses from left to right. Other state transitions are unlikely, but are not forbidden. Not shown  
 1836 are the transitions to the 'canceled' state from the 'pending', 'pending-held', and 'processing-stopped' states.

1837 **8.2.20.2 The “document-state” Document Description attribute and the Document object life Cycle**

1838 The “document-state” attribute is one of the most important Document Description attributes. Figure 2 shows the  
 1839 values of the “document-state” attribute and the Document object life cycle as affected by actions on the Job,  
 1840 Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the  
 1841 lifecycle of a Job<sup>52</sup>. Documents basically have three states. The first is waiting to be processed by a Job (i.e.  
 1842 pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it  
 1843 reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed,  
 1844 canceled, or aborted).

1845  
 1846

<sup>52</sup> The Document object is not really a sub-job. If the Document object were its own independent active object, i.e., were a sub-job, then the Document state would affect the job state and there would be complex and debatable roll-up rules for how the various “document-state” values of all of the Job’s document are rolled up to give a single value for the Job’s “job-state” attribute. Instead, the Job state reflects the overall processing of the job and is the same whether or not the Document object is supported.



1847  
1848 **Figure 2 - The "document-state" Document Description attribute and the Document object life Cycle**

1849 A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right  
1850 in the state diagram. No other state transitions are defined.

### 1851 8.2.20.3 Forwarding Servers

1852 As with all other IPP attributes, if the implementation can not determine the correct value for this attribute, it SHOULD  
1853 respond with the out-of-band value 'unknown' (see [rfc2911] Section 4.1) rather than try to guess at some possibly  
1854 incorrect value and give the end user the wrong impression about the state of the Job/Document object. For  
1855 example, if the implementation is just a gateway into some printing system from which it can normally get status, but  
1856 temporarily is unable, then the implementation should return the 'unknown' value. However, if the implementation is  
1857 a gateway to a printing system that never provides detailed status about the print job/document, the implementation  
1858 MAY set the IPP Job/Document object's state to 'completed', provided that it also sets the 'queued-in-device' value in  
1859 the job's/document's "job-state-reasons"/"document-state-reasons" attribute (see "job-state-reasons"/"document-  
1860 state-reasons" attribute below).

### 1861 8.2.20.4 Partitioning of Job/Document States

1862 This section partitions the job/document states into phases: Job/Document Not Completed, Job/Document  
1863 Retention, Job/Document History, and Job/Document Removal. This section also explains the 'job-restartable' value  
1864 of the "job-state-reasons" Job Description attribute for use with the Restart-Job operation.

1865 **Job/Document Not Completed:** When a job is in the 'pending', 'pending-held', 'processing', or 'processing-stopped'  
1866 states, the job is not completed. When a Document is in the 'pending' or 'processing' state, it is not completed.

1867 **Job Retention:** When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP  
1868 Printer object MAY "retain" the job in a restartable condition for an implementation-defined time period. This time  
1869 period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While  
1870 in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job  
1871 operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by  
1872 adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see section 8.2.22) during the Job  
1873 Retention phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-  
1874 Documents operations MUST be supported while the job is in the Job Retention phase.

1875 **Job History:** After the Job Retention phase expires for a job, the Printer object deletes the document data for the  
 1876 job and the job becomes part of the Job History. The Printer object MAY also delete any number of the job and  
 1877 document attributes. Since the job is no longer restartable, the Printer object MUST remove the 'job-restartable'  
 1878 value from the job's "job-state-reasons" attribute, if present. If the implementation supports the Document object, it  
 1879 SHOULD retain at least the "document-state" and "document-state-reasons" attributes on the Document object  
 1880 during the Job History phase which can be queried using the Get-Document-Attributes and Get-Documents  
 1881 operations.

1882 **Job Removal:** After the job has remained in the Job History for an implementation-defined time, such as when the  
 1883 number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer  
 1884 removes the Job and Document objects from the system.

1885 Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" Operation  
 1886 attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-  
 1887 Documents operation and supplying the 'completed' value for the "which-jobs" Operation attribute, a client is  
 1888 requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-  
 1889 Document-Attributes operation, a client is requesting a job/documents in any phase except Job Removal. After Job  
 1890 Removal, the Get-Job-Attributes/Get-Documents-Attributes and Get-Jobs/Get-Documents operations no longer are  
 1891 capable of returning any information about a job/document.

1892 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

### 1893 **8.2.21 document-state-message (text(MAX)) and job-state-message (text(MAX))**

1894 This OPTIONAL Document Description attribute specifies information about the "job-state"/"document-state" and  
 1895 "job-state-reasons"/"document-state-reasons" attributes in human readable text. If the Printer object supports this  
 1896 attribute, the Printer object MUST be able to generate this message in any of the natural languages identified by the  
 1897 Printer's "generated-natural-language-supported" attribute (see the "attributes-natural-language" Operation attribute  
 1898 specified in [rfc2911] Section 3.1.4.1).

1899 The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-  
 1900 reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the  
 1901 (localized text). For such additional information such as interpreter errors for application program consumption or  
 1902 specific document access errors, new attributes with keyword values, needs to be developed and registered.

### 1903 **8.2.22 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2 1904 keyword)**

1905 The REQUIRED "job-state-reasons" and the REQUIRED "document-state-reasons" Document Description attributes  
 1906 provide additional information about the job's and each document's current state, i.e., information that augments the  
 1907 value of the job's "job-state" attribute and each Document's "document-state" attribute, respectively. The Printer  
 1908 SHOULD support the same values for both the "job-state-reasons" and the "document-state-reasons" attribute for  
 1909 those attributes that are defined for both as indicated in the "Job" and "Doc" columns in Table 12.

1910 These values MAY be used with any job or document state or states for which the reason makes sense. Some of  
 1911 these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when  
 1912 implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the  
 1913 reason no longer applies whether the value of the Job's "job-state" attribute or the Document's "document-state"  
 1914 attribute changed or not. When the Job or Document does not have any reasons for being in its current state, the  
 1915 value of the Job's "job-state-reasons" attribute or Document's "document-state-reasons" attribute MUST be 'none'.

1916 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-  
 1917 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document  
 1918 objects are passive objects operated on by the containing Job object.

1919 Note: While values cannot be added to the "job-state" or "document-state" attributes without impacting deployed  
 1920 clients that take actions upon receiving "job-state" or "document-state" values, it is the intent that additional "job-  
 1921 state-reasons" and "document-state-reasons" values can be defined and registered without impacting such deployed  
 1922 clients. In other words, the "job-state-reasons" and the "document-state-reasons" attributes are intended to be  
 1923 extensible.

1924 Table 12 lists the standard keyword values for the "job-state-reasons" and/or "document-state-reasons" attributes  
 1925 defined in this and other IPP specifications as indicated in the References column. In Table 12 the keywords are  
 1926 listed in alphabetic order (observing the "[job-]" prefix), while in their descriptions following Table 12, they are listed in  
 1927 the most likely order of occurrence to help understanding.

1928 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job  
 1929 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.  
 1930 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD  
 1931 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all  
 1932 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1933 **Notation:**

1934 [job-] indicates a state reason keyword value that has the 'job-' prefix when it is a value of the "job-state-reasons"  
 1935 attribute, but does not have the 'job-' prefix when it is a value of the "document-state-reasons" attribute<sup>53</sup>.  
 1936 For purposes of sorting in Table 12, the "[job-]" prefix is observed, since this is an IPP specification.  
 1937 "-" indicates that the Job or Document value is *not* defined.

1938 **Table 12 - "job-state-reasons" and "document-state-reasons" attribute values**

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Job	Doc	Printer conformance	Reference
<b>job-state-reasons</b>	1setOf type2 keyword	y	- <sup>54</sup>	MUST	[rfc2911] §4.3.8
<b>document-state-reasons</b>	1setOf type2 keyword	-	y	MUST	8.2.22
	aborted-by-system	y	y	MAY	[rfc2911] §4.3.8
	compression-error	y	y	MAY	[rfc2911] §4.3.8
	document-access-error	y	y	MAY	[rfc2911] §4.3.8
	document-format-error	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-at-device	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-operator	y	y	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-user	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-successfully	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-with-errors	y	y	MAY	[rfc2911] §4.3.8
	[job-]completed-with-warnings	y	y	MAY	[rfc2911] §4.3.8
	job-data-insufficient	y	-	MAY	[rfc2911] §4.3.8
	job-hold-until-specified	y	-	MAY	[rfc2911] §4.3.8
	[job-]incoming	y	y	MAY	[rfc2911] §4.3.8
	[job-]interpreting	y	y	MAY	[rfc2911] §4.3.8
	[job-]outgoing	y	y	MAY	[rfc2911] §4.3.8
	job-password-wait	y	-	MAY	[ippsave] §8.3.1
	[job-]printing	y	y	MAY	[rfc2911] §4.3.8
	[job-]queued	y	y	MAY	[rfc2911] §4.3.8
	[job-]queued-for-marker	y	y	MAY	[rfc2911] §4.3.8

<sup>53</sup> For the PWG Semantic Model [pwg-sm], the "job-" prefix is being dropped altogether so that the same values can be used for both the JobStateReasons and DocumentStateReasons attributes.

<sup>54</sup> The Document Description attribute that corresponds to the "job-state-reasons" Job Description attribute is the (new) "document-state-reasons" attribute.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Job	Doc	Printer conformance	Reference
	job-restartable	y	-	MAY	[rfc2911] §4.3.8
	job-resuming	y	-	MAY	[ippsave] §8.3.1
	job-saved-successfully	y	-	MAY	[ippsave] §8.3.1
	job-save-error	y	-	MAY	[ippsave] §8.3.1
	job-saving	y	-	MAY	[ippsave] §8.3.1
	job-scheduling	y	-	MAY	[ippsave] §8.3.1
	[job-]spooling	y	y	MAY	[ippsave] §8.3.1
	[job-]streaming	y	y	MAY	[ippsave] §8.3.1
	job-suspended	y	-	MAY	[adm-ops] §9.1
	job-suspended-by-operator	y	-	MAY	[ippsave] §8.3.1
	job-suspended-by-system	y	-	MAY	[ippsave] §8.3.1
	job-suspended-by-user	y	-	MAY	[ippsave] §8.3.1
	job-suspending	y	-	MAY	[ippsave] §8.3.1
	[job-]transforming	y	y	MAY	[rfc2911] §4.3.8
	[job-]warnings-detected	y	y	MAY	[pwg5100.4] §7.1
	none	y	y	MUST	[rfc2911] §4.3.8
	printer-stopped	y	-	MAY	[rfc2911] §4.3.8
	printer-stopped-partly	y	-	MAY	[rfc2911] §4.3.8
	processing-to-stop-point	y	-	MAY	[rfc2911] §4.3.8
	proof-print-wait	y	-	MAY	[ippsave] §8.3.1
	queued-in-device	y	y	MAY	[rfc2911] §4.3.8
	resources-are-not-ready	y	-	MAY	[rfc2911] §4.3.8
	resources-are-not-supported	y	y	MAY	[pwg5100.3] §6.1
	service-off-line	y	-	MAY	[rfc2911] §4.3.8
	submission-interrupted	y	y	MAY	[rfc2911] §4.3.8
	unsupported-compression	y	y	MUST	[rfc2911] §4.3.8
	unsupported-document-format	y	y	MUST	[rfc2911] §4.3.8

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For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely to occur (if implemented), starting with the 'none' value. Note: The order is improved over that in [rfc2911]. The (JD), (J), and (D) notation is identical to the "Job" and "Doc" columns in Table 12 indicating whether the keyword is defined for the "job-state-reasons" and/or "document-state-reasons" attributes:

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

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

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

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

1958 **'resources-are-not-supported' (JD):** At least one of the resources needed by the job/document, such as  
1959 media, fonts, resource objects, etc., is not supported on any of the physical printers for which the  
1960 job/document is a candidate. This condition MAY be detected when the job/document is accepted,  
1961 or subsequently while the job/document is pending or processing, depending on implementation.  
1962 The job/document may (1) remain in its current state, (2) be moved to the 'pending-held' state,  
1963 depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer  
1964 is put into the 'stopped' state when the job/document is attempted to be processed on the Printer.  
1965 This value is intended for use with an implementation that supports the "user-defined-values-  
1966 supported" Printer attribute (see [pwg5100.3] section 6.1) which allows a job to be accepted with an  
1967 unsupported 'name' value.

1968 **'resources-are-not-ready' (JD):** At least one of the resources needed by the job/document, such as media,  
1969 fonts, resource objects, etc., is not ready on any of the physical printer's for which the job/document  
1970 is a candidate. This condition MAY be detected when the job/document is accepted, or  
1971 subsequently while the job/document is pending or processing, depending on implementation. The  
1972 job/document may remain in its current state or be moved to the 'pending-held' state, depending on  
1973 implementation and/or job/document scheduling policy.

1974 **'[job-]incoming' (JD):** Either (1) the Printer has accepted the Create-Job operation and is expecting  
1975 additional Send-Document and/or Send-URI operations or (2) the Printer is retrieving/accepting  
1976 document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation.

1977 **'[job-]spooling' (JD):** Same as 'job-incoming' with the specialization that the Printer is spooling the  
1978 Job/Document data before processing it. This value corresponds to the 'spool' or 'automatic' value of  
1979 the "job-spooling-supported" Printer Description attribute.

1980 **'[job-]streaming' (JD):** Same as 'job-incoming' with the specialization that the Printer is processing the  
1981 Job/Document data as it is being received (that is, the document is not being spooled, but rather is  
1982 being processed in chunks by the output device and is being imaged during reception). This value  
1983 corresponds to the 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description  
1984 attribute.

1985 **'job-data-insufficient' (J):** The Create-Job operation has been accepted by the Printer, but the Printer is  
1986 expecting additional document data before it can move the job into the 'processing' state. If a Printer  
1987 starts processing before it has received all data, the Printer removes the 'job-data-insufficient'  
1988 reason, but the 'job-incoming' remains. If a Printer starts processing after it has received all data, the  
1989 Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same time.

1990 **'unsupported-compression' (JD):** The job/document was aborted by the system because the Printer  
1991 determined while attempting to decompress the document-data's that the compression is actually not  
1992 among those supported by the Printer. This value MUST be supported, since "compressions is a  
1993 REQUIRED Operation attribute.

1994 **'compression-error' (JD):** The job/document was aborted by the system because the Printer encountered  
1995 an error in the document-data while decompressing it. If the Printer posts this reason, the document-  
1996 data has already passed any tests that would have led to the 'unsupported-compression' job-state-  
1997 reason/document-state-reason.

1998 **'document-access-error' (JD):** After accepting a Print-URI or Send-URI request, the Printer could not  
1999 access one or more documents passed by reference. This reason is intended to cover any file  
2000 access problem, including file does not exist and access denied because of an access control  
2001 problem. The Printer MAY also indicate the document access error using the "job-document-access-  
2002 errors" Job Description attribute (see the description of "job-document-access-errors" above).  
2003 Whether the Printer aborts the job/document and moves the job/document to the 'aborted' job state  
2004 or prints all documents that are accessible and moves the job/document to the 'completed'  
2005 job/document state and adds the 'completed-with-errors' value in the job's "job-state-reasons" or  
2006 document's "document-state-reasons" attribute depends on implementation and/or site policy. This  
2007 value SHOULD be supported if the Print-URI or Send-URI operations are supported.

- 2008 **'unsupported-document-format' (JD)**: The job/document was aborted by the system because the  
 2009 document-data's document-format is not among those supported by the Printer. If the client  
 2010 specifies the document-format as 'application/octet-stream', the printer MAY abort the job/document  
 2011 and post this reason even though the format is a member of the "document-format-supported" printer  
 2012 attribute, but not among the auto-sensed document-formats. This value MUST be supported, since  
 2013 "document-format" is a REQUIRED Operation attribute.
- 2014 **'document-format-error' (JD)**: The job/document was aborted by the system because the Printer  
 2015 encountered an error in the document-data while processing it. If the Printer posts this reason, the  
 2016 document-data has already passed any tests that would have led to the 'unsupported-document-  
 2017 format' job-state-reason/document-state-reason.
- 2018 **'submission-interrupted' (JD)**: The job or document was not completely submitted for some unforeseen  
 2019 reason, such as: (1) the Printer has crashed before the job was closed by the client, (2) the Printer or  
 2020 the document transfer method has crashed in some non-recoverable way before the document data  
 2021 was entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-  
 2022 out period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911]  
 2023 Section 4.4.31.
- 2024 **'[job-]outgoing' (JD)**: The Printer is transmitting the job/document to the output device.
- 2025 **'job-scheduling' (J)**: The printer is in the process of scheduling the processing for the Job.
- 2026 **'[job-]queued' (JD)**: Job is in the 'processing' state, but more specifically, the Printer has queued the  
 2027 Document data.
- 2028 **'[job-]transforming' (JD)**: Job/document is in the 'processing' state, but more specifically, the Printer is  
 2029 interpreting document data and producing another electronic representation.
- 2030 **'[job-]interpreting' (JD)**: Job/document is in the 'processing' state, but more specifically, the Printer is  
 2031 interpreting the document data.
- 2032 **'[job-]queued-for-marker' (JD)**: Job/document is in any of the 'pending-held', 'pending', or 'processing'  
 2033 states, but more specifically, the Printer has completed enough processing of the document to be  
 2034 able to start marking and the job/document is waiting for the marker. Systems that require human  
 2035 intervention to release jobs using the Release-Job operation, put the job into the 'pending-held' job  
 2036 state. Systems that automatically select a job to use the marker put the job into the 'pending' job  
 2037 state or keep the job in the 'processing' job state while waiting for the marker, depending on  
 2038 implementation. All implementations put the job/document into (or back into) the 'processing' state  
 2039 when marking does begin.
- 2040 **'[job-]printing' (JD)**: The output device is marking media. This value is useful for Printers which spend a  
 2041 great deal of time processing (1) when no marking is happening and then want to show that marking  
 2042 is now happening or (2) when the job/document is in the process of being canceled or aborted while  
 2043 the job/document remains in the 'processing' state, but the marking has not yet stopped so that  
 2044 impression or sheet counts are still increasing for the job/document.
- 2045 **'printer-stopped-partly' (J)**: The value of the Printer's "printer-state-reasons" attribute contains the value  
 2046 'stopped-partly'.
- 2047 **'printer-stopped' (J)**: The value of the Printer's "printer-state" attribute is 'stopped'.
- 2048 **'job-suspending' (J)**: The printer is in the process of moving the Job from a processing condition to a  
 2049 suspended condition where other jobs can be processed.
- 2050 **'job-suspended' (J)**: The job has been suspended while processing using the Suspend-Current-Job  
 2051 operation and other jobs can be processed on the Printer. The Job can be resumed using the  
 2052 Resume-Job operation which removes this value. Note: Documents cannot be suspended and there  
 2053 is no Suspend-Current-Document operation.
- 2054 **'job-suspended-by-operator' (J)**: The Job has been indefinitely suspended by the printer operator.

- 2055 **'job-suspended-by-user' (J)**: The Job has been indefinitely suspended by the user.
- 2056 **'job-suspended-by-system' (J)**: The Job has been indefinitely suspended by the Printer's system software  
2057 during normal processing of the job.
- 2058 **'job-resuming' (J)**: The printer is in the process of moving the Job from a suspended condition to become a  
2059 candidate for processing.
- 2060 **'[job-]canceled-by-user' (JD)**: The job/document was canceled by the owner of the job using the Cancel-  
2061 Job/Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value  
2062 of the originating user that created the Job object, or by some other authorized end-user, such as a  
2063 member of the job owner's security group. This 'job-canceled' value SHOULD be supported. The  
2064 'canceled-by-user' value SHOULD be supported for the "document-state-reasons" attributes for use  
2065 with the Cancel-Document.
- 2066 **'[job-]canceled-by-operator' (JD)**: The job/document was canceled by the operator using the Cancel-  
2067 Job/Cancel-Document request, i.e., by a user who has been authenticated as having operator  
2068 privileges (whether local or remote). If the security policy is to allow anyone to cancel anyone's  
2069 job/document, then these values may be used when the job/document is canceled by other than the  
2070 owner of the job. For such a security policy, in effect, everyone is an operator as far as canceling  
2071 jobs/documents is concerned. These values SHOULD be supported if the implementation permits  
2072 canceling by other than the owner of the job.
- 2073 **'[job-]canceled-at-device' (JD)**: The job/document was canceled by an unidentified local user, i.e., a user  
2074 at a console at the device. This value SHOULD be supported if the implementation supports  
2075 canceling jobs/documents at the console.
- 2076 **'aborted-by-system' (JD)**: The job/document (1) is in the process of being aborted, (2) has been aborted by  
2077 the system and placed in the 'aborted' state, or (3) has been aborted by the system and placed in the  
2078 'pending-held' state, so that a user or operator can manually try the job/document again. This value  
2079 SHOULD be supported.
- 2080 **'processing-to-stop-point' (J)**: The requester has issued a Cancel-Job/Cancel-Document operation or the  
2081 Printer object has aborted the job/document, but is still performing some actions on the job/document  
2082 until a specified stop point occurs or job/document termination/cleanup is completed.  
2083 If the implementation requires some measurable time to cancel the job/document in the 'processing'  
2084 or 'processing-stopped' job/document states, the Printer MUST use this value to indicate that the  
2085 Printer object is still performing some actions on the job/document while the job/document remains in  
2086 the 'processing' or 'processing-stopped' state. After all the job's/document's job/document  
2087 description attributes have stopped incrementing, the Printer object moves the job/document from  
2088 the 'processing' state to the 'canceled' or 'aborted' job/document states.
- 2089 **'service-off-line' (J)**: The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the  
2090 'pending-held' state. This situation could be true if the service's or document transform's input is  
2091 impaired or broken.
- 2092 **'[job-]warnings-detected' (JD)**: If the Printer supports these values, the Printer MUST add the value to "job-  
2093 state-reasons" / "document-state-reasons" when it generates the first warning message. That is, a  
2094 single occurrence of this value is present in the "job-state-reasons" / "document-state-reasons" if the  
2095 Printer has generated one or more warnings.
- 2096 **'[job-]completed-successfully' (JD)**: The job/document completed successfully. There were no warnings  
2097 or errors in printing. This value SHOULD be supported.
- 2098 **'[job-]completed-with-warnings' (JD)**: The print part of the job/document completed with warnings  
2099 (whether or not there were save errors). This value SHOULD be supported if the implementation  
2100 detects warnings. [rfc2911]
- 2101 **'[job-]completed-with-errors' (JD)**: The print part of the job/document completed with errors (and possibly  
2102 warnings too) (whether or not there were save errors). This value SHOULD be supported if the  
2103 implementation detects errors. [rfc2911]

- 2104 **'job-saving' (J):** The Printer is transmitting the Job to the save location. This is similar to the 'job-printing'  
2105 value.
- 2106 **'job-saved-successfully' (J):** The Printer saved the Job successfully.
- 2107 **'job-save-error' (J):** The Printer did not save the Job successfully (whether or not it was printed successfully,  
2108 printed with warnings, printed with errors, or not printed). The Printer MUST ensure that none of the  
2109 saved job is accessible, if it was unable to successfully save all of the job.
- 2110 **'job-restartable' (J):** This job is retained (see the description of "job-state" above, specifically "Partitioning of  
2111 Job States") and is currently able to be restarted using the Restart-Job operation (see [rfc2911]  
2112 Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer  
2113 MUST accept a Restart-Job operation for that job. This value SHOULD be supported if the Restart-  
2114 Job operation is supported.
- 2115 **'queued-in-device' (JD):** The job/document has been forwarded to a device or print system that is unable to  
2116 send back status. The Printer sets the job's/document's "job-state" / "document-state" attribute to  
2117 'completed' and adds the 'queued-in-device' value to the job's/document's "job-state-reasons" /  
2118 "document-state-reasons" attribute to indicate that the Printer has no additional information about the  
2119 job/document and never will have any better information. See the description of the "job-state" /  
2120 "document-state" attribute above, specifically the portion on "Forwarding Servers".
- 2121 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

### 2122 8.2.23 document-uri (uri)

- 2123 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a  
2124 Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the  
2125 Send-URI operation (see section 3.4).

### 2126 8.2.24 impressions-completed-current-copy (integer(0:MAX))

- 2127 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
2128 attribute (see [rfc3381] §4.4) applied to the Document object.

### 2129 8.2.25 [job-]detailed-status-message (1setOf text(MAX))

- 2130 This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the  
2131 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.10) applied to the  
2132 Document object.

### 2133 8.2.26 [job-]document-access-errors (1setOf text(MAX))

- 2134 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the  
2135 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.11) applied to the  
2136 Document object.

### 2137 8.2.27 [job-]impressions (integer(0:MAX))

- 2138 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-  
2139 impressions" Job Description attribute (see [rfc2911] §4.3.17.2) applied to the Document object. The Printer sets  
2140 this Document Description attribute from the corresponding Operation attribute supplied by the client in the  
2141 Document Creation operation (see section 3.1).

**2142 8.2.28 [job-]impressions-completed (integer(0:MAX))**

2143 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the  
2144 corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] §4.3.18.2) applied to the  
2145 Document object.

**2146 8.2.29 [job-]k-octets (integer(0:MAX))**

2147 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-  
2148 octets" Job Description attribute (see [rfc2911] §4.3.17.1) applied to the Document object. The Printer sets this  
2149 Document Description attribute from the corresponding Operation attribute supplied by the client in the Document  
2150 Creation operation (see section 3.1).

**2151 8.2.30 [job-]k-octets-processed (integer(0:MAX))**

2152 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding  
2153 "job-k-octets-processed" Job Description attribute (see [rfc2911] §4.3.18.1) applied to the Document object.

**2154 8.2.31 [job-]media-sheets (integer(0:MAX))**

2155 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-  
2156 media-sheets" Job Description attribute (see [rfc2911] §4.3.17.3) applied to the Document object. The Printer sets  
2157 this Document Description attribute from the corresponding Operation attribute supplied by the client in the  
2158 Document Creation operation (see section 3.1).

**2159 8.2.32 [job-]media-sheets-completed (integer(0:MAX))**

2160 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-  
2161 media-sheets-completed" Job Description attribute (see [rfc2911] 4.3.18.3) applied to the Document object.

**2162 8.2.33 [job-]more-info (uri)**

2163 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-  
2164 more-info" Job Description attribute (see [rfc2911] §4.3.4) applied to the Document object.

**2165 8.2.34 [job-]printer-up-time (integer (1:MAX))**

2166 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the  
2167 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description  
2168 attribute (see [rfc2911] section 4.4.29).

2169 A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value  
2170 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes  
2171 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of  
2172 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-  
2173 xxx" event occurred by subtracting this difference from the client's wall-clock time.

**2174 8.2.35 [job-]warnings-count (integer(0:MAX))**

2175 This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding  
2176 "job-warnings-count" Job Description attribute (see [pwg5100.4] §6.1.) applied to the Document object. See  
2177 [pwg5100.4] §6.1.

2178 **8.2.36 last-document (boolean)**

2179 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the  
 2180 Job. See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation  
 2181 attribute supplied by the client in the Document Creation operation (see section 3.1). If the client issues the Close-  
 2182 Job operation (see section 4.3.1), the Printer sets the value of the “last-document” Document Description attribute of  
 2183 the last document in the Job to ‘true’.

2184 **8.2.37 output-device-assigned (name(127))**

2185 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
 2186 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

2187 **8.2.38 sheet-completed-copy-number (integer(0:MAX))**

2188 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description  
 2189 attribute (see [rfc3381] §4.2) applied to the Document object.

2190 **8.2.39 time-at-completed (integer (MIN:MAX))**

2191 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
 2192 attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

2193 **8.2.40 time-at-creation (integer (MIN:MAX))**

2194 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
 2195 attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

2196 **8.2.41 time-at-processing (integer (MIN:MAX))**

2197 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description  
 2198 attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

2199 **9 Printer attributes**

2200 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three  
 2201 disjoint groups:  
 2202

Job Template attributes (JT)	These Printer attributes are related directly to the “xxx” Job Template attributes that a client can supply in a Job Creation request as follows: <ol style="list-style-type: none"> <li>1. “xxx-supported” indicate the supported values</li> <li>2. “xxx-default” indicate the values that will be used if the client and the PDL omit the attribute.</li> <li>3. “xxx-ready” indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as “media” and possibly “job-finishing”.</li> </ol> These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: “requested-attributes” = ‘job-template’.
Document Template attributes (DT)	These Printer attributes are related directly to the “xxx” Document Template attributes that a client can supply in a Document Creation request as follows: <ol style="list-style-type: none"> <li>1. “xxx-supported” indicate the supported values</li> <li>2. “xxx-default” indicate the values that will be used if the client and the PDL</li> </ol>

	<p>omit the attribute.</p> <p>3. "xxx-ready" indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "finishing".</p> <p>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'document-template'.</p>
Printer Description attributes (PD)	These Printer attributes describe the Printer, such as "printer-name" and "printer-location". Some of them are "xxx-supported" and "xxx-default" for Operation attributes that the client can supply in a Job Creation request.
neither (-)	These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.

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

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**"Attribute Syntax"** - indicates the attribute syntax (see [rfc2911] section 4.1). Many "xxx-default" and "xxx-supported" attributes have the 'collection' syntax which consists of a number of member attributes. These member attributes are not listed in this table when they are the same as the corresponding "xxx" attribute in Table 9. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.

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**"Grp"** - indicates to which group the attribute belongs. "PD" = Printer Description; "JT" = Job Template as explained above.

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

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

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**ISSUE 14- TBD ACTION (Tom)** - Need to add the "xxx-default" and "xxx-supported" to Table 14 that go with the Document Template attributes.

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**Table 13 - Printer attributes (Job Template and Printer Description)**

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>charset-configured</b>	charset	PD	MUST	[rfc2911] §4.4.17
<b>charset-supported</b>	1setOf charset	PD	MUST	[rfc2911] §4.4.18
<b>color-supported</b>	boolean	PD	MAY	[rfc2911] §4.4.26
<b>compression-supported</b>	type3 keyword	PD	MUST	[rfc2911] §4.4.32
<b>copies-default</b>	integer(1:MAX)	JT	MAY	[rfc2911] §4.2.5
<b>copies-supported</b>	rangeOfInteger(1:MAX)	JT	MAY	[rfc2911] §4.2.5
<b>cover-back-default</b>	collection	JT	MAY	[pwg5100.3] §3.1.3
<b>cover-back-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.1.4
<b>cover-front-default</b>	collection	JT	MAY	[pwg5100.3] §3.1.3
<b>cover-front-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.1.4
<b>cover-type-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.1.2.1
<b>document-creation-attributes-supported</b>	1setOf type2 keyword	PD	<del>MAY</del> MUST	[this-spec] §9.1

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>document-format-default</b>	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
<b><u>document-format-details-supported</u></b>	<u>1setOf type2 keyword</u>	<u>PD</u>	<u>CMUS</u> <u>T<sup>55</sup></u>	<u>§9.2</u>
<b><u>document-format-details-implemented</u></b>	<u>1setOf collection</u>	<u>PD</u>	<u>CMUS</u> <u>T<sup>56</sup></u>	<u>§9.3</u>
<b>document-format-supported</b>	1setOf mimeMediaType	PD	MUST	[rfc2911] §4.4.22
<b>document-format-varying-attributes</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.3
<b>document-overrides-supported</b>	1setOf type2 keyword		MAY	[pwg5100.4] §5.1.14
<b>finishings-col-default</b>	collection	JT	MAY	[pwg5100.3] §3.2.3
<b>finishings-col-ready</b>	1setOf collection	JT	MAY	[pwg5100.3] §3.2.4
<b>finishings-col-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.2.5
<b>finishings-default</b>	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.6
<b>finishings-ready</b>	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.6
<b>finishings-supported</b>	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.6
<b>finishing-template-supported</b>	1setOf name(MAX)	-	MAY	[pwg5100.3] §3.2.1.1
<b>force-front-side-default</b>	1setOf integer(1:MAX)	JT	MAY	[pwg5100.3] §3.3
<b>force-front-side-supported</b>	rangeOfInteger(1:MAX)	JT	MAY	[pwg5100.3] §3.3
<b>generated-natural-language-supported</b>	1setOf naturalLanguage	PD	MUST	[rfc2911] §4.4.20
<b>imposition-template-default</b>	type3 keyword   name(MAX)	-	MAY	[pwg5100.3] §3.4
<b>imposition-template-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.4
<b>insert-after-page-number-supported</b>	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.1.1
<b>insert-count-supported</b>	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.2.1
<b>insert-sheet-default</b>	1setOf collection	JT	MAY	[pwg5100.3] §3.5.4
<b>insert-sheet-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.5.5
<b>ippget-event-life</b>	integer(15:MAX)	PD	MAY	[get-method] §8.1
<b>ipp-versions-supported</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.20
<b>job-account-id-default</b>	name(MAX)	JT	MAY	[pwg5100.3] §3.6
<b>job-account-id-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.6
<b>job-accounting-output-bin-default</b>	type3 keyword   name(MAX)	-	MAY	[pwg5100.3] §3.8.3.1
<b>job-accounting-output-bin-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.8.3.2
<b>job-accounting-sheets-default</b>	collection	JT	MAY	[pwg5100.3] §3.8.4
<b>job-accounting-sheets-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.8.5
<b>job-accounting-sheets-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.8.1.1
<b>job-accounting-user-id-default</b>	name(MAX)	JT	MAY	[pwg5100.3] §3.7
<b>job-accounting-user-id-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.7
<b>job-creation-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[ippsave] §7.1
<b>job-error-sheet-default</b>	collection	JT	MAY	[pwg5100.3] §3.7
<b>job-error-sheet-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.9.5
<b>job-error-sheet-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.9.1.1
<b>job-error-sheet-when-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.9.2.1

<sup>55</sup> The Printer MUST support “document-format-details-supported” if it supports a container document format, such as application/zip or multipart/related.

<sup>56</sup> The Printer MUST support “document-format-details-implemented” if it supports a container document format, such as application/zip or multipart/related.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>job-hold-until-default</b>	type3 keyword   name(MAX)	JT	MAY	[rfc2911] §4.2.2
<b>job-hold-until-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[rfc2911] §4.2.2
<b>job-impressions-supported</b>	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.34
<b>job-k-octets-supported</b>	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.33
<b>job-media-sheets-supported</b>	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.35
<b>job-message-to-operator-default</b>	text(MAX)	JT	MAY	[pwg5100.3] §3.12
<b>job-message-to-operator-supported</b>	boolean	JT	MAY	[pwg5100.3] §3.12
<b>job-password-supported</b>	integer(0:127)	PD	MAY	[ippsave] §7.2
<b>job-password-encryption-supported</b>	1setOf (type3 keyword   name(MAX))	PD	MAY	[ippsave] §7.3
<b>job-priority-default</b>	integer(1:100)	JT	MAY	[rfc2911] §4.2.1
<b>job-priority-supported</b>	1setOf integer(1:100)	JT	MAY	[rfc2911] §4.2.1
<b>job-settable-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.2
<b>job-sheet-message-default</b>	text(MAX)		MAY	[pwg5100.3] §3.12
<b>job-sheet-message-supported</b>	boolean		MAY	[pwg5100.3] §3.12
<b>job-sheets-col-default</b>	collection	JT	MAY	[pwg5100.3] §3.11.3
<b>job-sheets-col-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.11.4
<b>job-sheets-default</b>	type3 keyword   name(MAX)	JT	MAY	[rfc2911] §4.2.3
<b>job-sheets-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[rfc2911] §4.2.3
<b>job-spooling-supported</b>	type2 keyword	PD	MAY	[ippsave] §7.4
<b>max-save-info-supported</b>	integer(1:MAX)	PD	MAY	[ippsave] §7.5
<b>max-stitching-locations-supported</b>	integer(1:MAX)	PD	MAY	[pwg5100.3] §5.2
<b>media-back-coating-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.10.2
<b>media-col-database</b>	1setOf collection	- <sup>57</sup>	MAY	[ippsave] §7.6
<i>any "media-col" member attribute</i>				
<b>media-col-default</b>	collection	JT	MAY	[pwg5100.3] §3.13.12
<i>any "media-col" member attribute</i>				
<b>media-color-supported</b>	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.13.4.1
<b>media-col-ready</b>	1setOf collection	JT	MAY	[pwg5100.3] §3.13.13
<i>any "media-col" member attribute</i>				
<b>media-col-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.13.14
<b>media-default</b>	type3 keyword   name(MAX)	JT	MAY	[rfc2911] §4.2.11
<b>media-front-coating-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.10.1
<b>media-hole-count-supported</b>	1setOf rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.13.6.1
<b>media-info-supported</b>	boolean	-	MAY	[pwg5100.3] §3.13.3.1
<b>media-input-tray-check-default</b>	type3 keyword   name(MAX)	JT	MAY	[pwg5100.3] §3.14
<b>media-input-tray-check-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[pwg5100.3] §3.14
<b>media-key-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.1.1
<b>media-order-count-supported</b>	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.7.1
<b>media-pre-printed-supported</b>	1setOf (type3 keyword	-	MAY	[pwg5100.3] §3.13.5.1

<sup>57</sup> The "media-col-database" attribute is not returned when the client requests 'all' or 'printer-description' attribute group because there MAY be a large number of values. Instead the client MUST query "media-col-database" explicitly in a Get-Printer-Attributes request.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
	name(MAX))			
<b>media-ready</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[rfc2911] §4.2.11
<b>media-recycled-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.11.1
<b>media-size-supported</b>	1setOf collection	-	MAY	[pwg5100.3] §3.13.8.3
<b>media-supported</b>	1setOf (type3 keyword   name(MAX))	JT	MAY	[rfc2911] §4.2.11
<b>media-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.13.2.1
<b>media-weight-metric-supported</b>	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.9.1
<b>multiple-document-handling-default</b>	type2 keyword	JT	MAY	[rfc2911] §4.2.4
<b>multiple-document-handling-supported</b>	1setOf type2 keyword	JT	MAY	[rfc2911] §4.2.4
<b>multiple-document-jobs-supported</b>	boolean	PD	MAY	[rfc2911] §4.4.16
<b>multiple-operation-time-out</b>	integer(1:MAX)	PD	MAY	[rfc2911] §4.4.31
<b>natural-language-configured</b>	naturalLanguage	PD	MUST	[rfc2911] §4.4.19
<b>notify-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.4
<b>notify-events-default</b>	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
<b>notify-events-supported</b>	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
<b>notify-lease-duration-default</b>	integer(0:67108863)	PD	MAY	[ntfy] §5.3.8
<b>notify-lease-duration-supported</b>	1setOf (integer(0: 67108863)   rangeOfInteger(0:67108863))	PD	MAY	[ntfy] §5.3.8
<b>notify-lease-expiration-time</b>	integer(0:MAX)	PD	MAY	[ntfy] §5.4.3
<b>notify-max-events-supported</b>	integer(2:MAX)	PD	MAY	[ntfy] §5.3.3
<b>notify-pull-method-supported</b>	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.2
<b>notify-schemes-supported</b>	1setOf uriScheme	PD	MAY	[ntfy] §5.3.1
<b>number-up-default</b>	integer(1:MAX)	JT	MAY	[rfc2911] §4.2.9
<b>number-up-supported</b>	1setOf (integer(1:MAX)   rangeOfInteger(1:MAX))	JT	MAY	[rfc2911] §4.2.9
<b>operations-supported</b>	1setOf type2 enum	PD	MUST	[rfc2911] §4.4.15
<b>orientation-requested-default</b>	type2 enum	JT	MAY	[rfc2911] §4.2.10
<b>orientation-requested-supported</b>	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.10
<b>output-bin-default</b>	type2 keyword   name(MAX)	JT	MAY	[pwg5100.2] §2.1
<b>output-bin-supported</b>	1setOf (type2 keyword   name(MAX))	JT	MAY	[pwg5100.2] §2.1
<b>page-delivery-default</b>	type2 keyword	JT	MAY	[pwg5100.3] §3.15
<b>page-delivery-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.15
<b>page-order-received-default</b>	type2 keyword	JT	MAY	[pwg5100.3] §3.16
<b>page-order-received-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.16
<b>page-overrides-supported</b>	1setOf type2 keyword	PD	MAY	[pwg5100.4] §5.2.9
<b>page-ranges-supported</b>	boolean	JT	MAY	[rfc2911] §4.2.7
<b>pages-per-minute</b>	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.36
<b>pages-per-minute-color</b>	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.37
<b>pages-per-subset-supported</b>	boolean	PD	MAY	[pwg5100.4] §5.3.2
<b>parent-printers-supported</b>	1setOf uri	PD	MAY	[adm-ops] §7.2
<b>pdl-override-supported</b>	type2 keyword	PD	MUST	[rfc2911] §4.4.28 [ippsave] §8.1
<b>presentation-direction-number-up-default</b>	type2 keyword	JT	MAY	[pwg5100.3] §3.17

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>presentation-direction-number-up-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.17
<b>printer-current-time</b>	dateTime	PD	MAY	[rfc2911] §4.4.30
<b>printer-detailed-status-messages</b>	1setOf text(MAX)	PD	MAY	[ippsave] §7.7
<b>printer-driver-installer</b>	uri	PD	MAY	[rfc2911] §4.4.8
<b>printer-info</b>	text(127)	PD	MAY	[rfc2911] §4.4.6
<b>printer-is-accepting-jobs</b>	boolean	PD	MUST	[rfc2911] §4.4.23
<b>printer-location</b>	text(127)	PD	MAY	[rfc2911] §4.4.5
<b>printer-make-and-model</b>	text(127)	PD	MAY	[rfc2911] §4.4.9
<b>printer-message-date-time</b>	dateTime	PD	MAY	[rfc3380] §6.5
<b>printer-message-from-operator</b>	text(127)	PD	MAY	[rfc2911] §4.4.25
<b>printer-message-time</b>	integer(MIN:MAX)	PD	MAY	[rfc3380] §6.4
<b>printer-more-info</b>	uri	PD	MAY	[rfc2911] §4.4.7
<b>printer-more-info-manufacturer</b>	uri	PD	MAY	[rfc2911] §4.4.10
<b>printer-name</b>	name(127)	PD	MUST	[rfc2911] §4.4.4
<b>printer-notify-server-uri</b>	uri	PD	MAY	[not-srv] §4.1
<b>printer-resolution-default</b>	resolution	JT	MAY	[rfc2911] §4.2.12
<b>printer-resolution-supported</b>	1setOf resolution	JT	MAY	[rfc2911] §4.2.12
<b>printer-settable-attributes-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.1
<b>printer-state</b>	type1 enum	PD	MUST	[rfc2911] §4.4.11
<b>printer-state-change-date-time</b>	dateTime	PD	MAY	[ntfy] §6.2
<b>printer-state-change-time</b>	integer(1:MAX)	PD	MAY	[ntfy] §6.1
<b>printer-state-message</b>	text(MAX)	PD	MAY	[rfc2911] §4.4.13
<b>printer-state-reasons</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.12
<b>printer-up-time</b>	integer(1:MAX))	PD	MUST	[rfc2911] §4.4.29
<b>printer-uri-supported</b>	1setOf uri	PD	MUST	[rfc2911] §4.4.1
<b>printer-xri-supported</b>	1setOf collection	PD	MAY	[rfc3380] §6.6
<b>xri-uri</b>	uri	PD	MUST	[rfc3380] §6.6
<b>xri-authentication</b>	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
<b>xri-security</b>	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
<b>print-quality-default</b>	type2 enum	JT	MAY	[rfc2911] §4.2.13
<b>print-quality-supported</b>	1setOf type2 enum	JT	MAY	[rfc2911] §4.2.13
<b>queued-job-count</b>	integer(0:MAX)	PD	MUST	[rfc2911] §4.4.24
<b>reference-uri-schemes-supported</b>	1setOf uriScheme	PD	MAY	[rfc2911] §4.4.27
<b>separator-sheets-default</b>	collection	JT	MAY	[pwg5100.3] §3.18.3
<b>separator-sheets-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.18.4
<b>separator-sheets-type-supported</b>	1setOf (type3 keyword   name(MAX))	-	MAY	[pwg5100.3] §3.18.1.1
<b>sheet-collate-default</b>	type2 keyword	JT	MAY	[rfc3381] §3.1
<b>sheet-collate-supported</b>	1setOf type2 keyword	JT	MAY	[rfc3381] §3.1
<b>sides-default</b>	type2 keyword	JT	MAY	[rfc2911] §4.2.8
<b>sides-supported</b>	1setOf type2 keyword	JT	MAY	[rfc2911] §4.2.8
<b>stitching-locations-supported</b>	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.3.1
<b>stitching-offset-supported</b>	1setOf (integer(0:MAX)   rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.2.1
<b>stitching-reference-edge-supported</b>	1setOf type2 keyword		MAY	[pwg5100.3] §3.2.2.1.1
<b>subordinate-printers-supported</b>	1setOf uri	PD	MAY	[adm-ops] §7.1
<b>uri-authentication-supported</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.2
<b>uri-security-supported</b>	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.3

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
<b>user-defined-values-supported</b>	1setOf type2 keyword	PD	MAY	[pwg5100.3] §5.1
<b>which-jobs-supported</b>	1setOf type2 keyword	PD	MAY	[ippsave] §7.8
<b>x-image-position-default</b>	type2 keyword	JT	MAY	[pwg5100.3] §3.19.2
<b>x-image-position-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.19.2
<b>x-image-shift-default</b>	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.3
<b>x-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.3
<b>xri-authentication-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.8
<b>xri-security-supported</b>	1setOf type2 keyword	PD	MAY	[rfc3380] §6.9
<b>xri-uri-scheme-supported</b>	1setOf uriScheme	PD	MAY	[rfc3380] §6.7
<b>x-side1-image-shift-default</b>	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.4
<b>x-side1-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.4
<b>x-side2-image-shift-default</b>	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.5
<b>x-side2-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.5
<b>y-image-position-default</b>	type2 keyword	JT	MAY	[pwg5100.3] §3.19.6
<b>y-image-position-supported</b>	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.19.6
<b>y-image-shift-default</b>	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.7
<b>y-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.7
<b>y-side1-image-shift-default</b>	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.8
<b>y-side1-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.8
<b>y-side2-image-shift-default</b>	integer(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.9
<b>y-side2-image-shift-supported</b>	rangeOfInteger(MIN:MAX)	JT	MAY	[pwg5100.3] §3.19.9

2225

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

2226

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

2227  
2228  
2229

### 9.2 document-format-details-supported (1setOf type2 keyword)

2230

This **OPTIONAL** Printer Description attribute lists the type2 keyword names of the member attributes of "document-format-details" that the Printer supports. If the Printer supports the "document-format-details" (1setOf collection) Operation attribute, the Printer **MUST** support this "document-format-details" (1setOf type2 keyword). Table 14 lists the type2 keywords defined for use in the "document-format-details-supported" Printer attribute.

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2232  
2233  
2234

**Table 14 - Keyword values of "document-format-details-supported Printer attribute**

2235

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

2236

2237 **9.3 document-format-details-implemented (1setOf collection)**

2238 This OPTIONAL Printer Description attribute lists the combinations of the values of the member attributes of  
 2239 "document-format-details" that the Printer has implemented, that is, that the Printer will accept if the client supplies  
 2240 the "document-format-details" Document Creation Operation attribute in combination with the "ipp-attribute-fidelity"  
 2241 Job Creation Operation attribute with a 'true' value. If the Printer supports the "document-format-details" Operation  
 2242 attribute, the Printer MUST support this attribute with the same member attributes that it supports for the "document-  
 2243 format-details" as indicated in the Printer's "document-format-details-supported" attribute. Each "xxx-implemented"  
 2244 member attribute is multi-valued with the same attribute syntax as the corresponding "document-format-details"  
 2245 attribute.

2246 **Table 15 - Member attributes of the "document-format-details-implemented" Printer attribute**

<u>"document-format-details-implemented" member attributes</u>	<u>Reference</u>
<u>document-creator-application-name-implemented (1setOf name(MAX))</u>	6.1.2.1
<u>document-creator-application-version-implemented (1setOf text(127))</u>	6.1.2.2
<u>document-creator-os-name-implemented (1setOf name(40))</u>	6.1.2.3
<u>document-creator-os-version-implemented (1setOf text(40))</u>	6.1.2.4
<u>document-format-implemented (1setOf mimeType)</u>	6.1.2.5
<u>document-format-device-id-implemented (1setOf text(127))</u>	6.1.2.6
<u>document-format-version-implemented (1setOf text(127))</u>	6.1.2.7
<u>document-natural-language-implemented (1setOf naturalLanguage)</u>	6.1.2.8

2247  
 2248 Typically, there will only be one value for each "document-format" member attribute in each collection value.  
 2249 However, there can be more than one occurrence of a collection value with the same "document-format" member  
 2250 attribute value. See the following example which has two PostScript collection values.

2251 Example: Suppose that a Printer implements a PostScript™ Level 3 interpreter which also interprets Level 1 and  
 2252 Level 2 documents and a PCL interpreter that interprets '5' and '5e' variants. Suppose that the Printer only has fonts  
 2253 for French and German for level 3. The value of "document-format-details-implemented" would be the following three  
 2254 collection values:

2255 {{"document-format-implemented" = 'application/postscript', "document-format-version-implemented" = '1', '2', '3'},  
 2256 {"document-format-implemented" = 'application/postscript', "document-format-version-implemented" = '3',  
 2257 document-natural-language}=en, fr, de},  
 2258 {"document-format-implemented" = 'application/vnd.hp-PCL', "document-format-version-implemented" = '5', '5e'}}

2259 **9.4 printer-state-reasons (1setOf type2 keyword)**

2260 This Printer Description attribute augments the "printer-state" of the Printer with additional information about the state  
 2261 of the Printer. Table 16 lists all of the values defined for the "printer-state-reasons" Printer Description attribute.

2262 **Table 16 - Values of the "printer-state-reasons" Printer attribute**

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
<b>printer-state-reasons</b>	1setOf type2 keyword	MUST	[rfc2911] §4.4.12
	other	MAY	[rfc2911] §4.4.12
	none	MUST	[rfc2911] §4.4.12

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	connecting-to-device	MAY	[rfc2911] §4.4.12
	cover-open	MAY	[rfc2911] §4.4.12
	deactivated	MAY	[adm-ops] §8.2
	developer-empty	MAY	[rfc2911] §4.4.12
	developer-low	MAY	[rfc2911] §4.4.12
	door-open	MAY	[rfc2911] §4.4.12
	fuser-over-temp	MAY	[rfc2911] §4.4.12
	fuser-under-temp	MAY	[rfc2911] §4.4.12
	hold-new-jobs	MAY	[adm-ops] §8.1
	input-tray-missing	MAY	[rfc2911] §4.4.12
	interlock-open	MAY	[rfc2911] §4.4.12
	interpreter-resource-unavailable	MAY	[rfc2911] §4.4.12
	marker-supply-empty	MAY	[rfc2911] §4.4.12
	marker-supply-low	MAY	[rfc2911] §4.4.12
	marker-waste-almost-full	MAY	[rfc2911] §4.4.12
	marker-waste-full	MAY	[rfc2911] §4.4.12
	media-empty	MAY	[rfc2911] §4.4.12
	media-jam	MAY	[rfc2911] §4.4.12
	media-low	MAY	[rfc2911] §4.4.12
	media-needed	MAY	[rfc2911] §4.4.12
	moving-to-paused	CMUST <sup>58</sup>	[rfc2911] §4.4.12
	opc-life-over	MAY	[rfc2911] §4.4.12
	opc-near-eol	MAY	[rfc2911] §4.4.12
	output-area-almost-full	MAY	[rfc2911] §4.4.12
	output-area-full	MAY	[rfc2911] §4.4.12
	output-tray-missing	MAY	[rfc2911] §4.4.12
	paused	CMUST <sup>59</sup>	[rfc2911] §4.4.12
	shutdown	MAY	[rfc2911] §4.4.12
	spool-area-full	SHOULD	[rfc2911] §4.4.12
	stopped-partly	MAY	[rfc2911] §4.4.12
	stopping	MAY	[rfc2911] §4.4.12
	timed-out	MAY	[rfc2911] §4.4.12
	toner-empty	MAY	[rfc2911] §4.4.12
	toner-low	MAY	[rfc2911] §4.4.12

2263

2264 This description is taken from [rfc2911] with additions from other IPP extension documents:

2265 This REQUIRED Printer attribute supplies additional detail about the device's state. Some of these value  
 2266 definitions indicate conformance requirements; the rest are OPTIONAL.

2267 Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe),  
 2268 warning, and error (most severe).

<sup>58</sup> The 'moving-to-paused' value MUST be supported if the Pause-Printer operation is supported and it takes significant time to move to paused.

<sup>59</sup> The 'paused' value MUST be supported if the Pause-Printer operation is supported.

2269 **'-report'**: This suffix indicates that the reason is a "report". An implementation may choose to omit some or  
 2270 all reports. Some reports specify finer granularity about the printer state; others serve as a precursor  
 2271 to a warning. A report MUST contain nothing that could affect the printed output.

2272 **'-warning'**: This suffix indicates that the reason is a "warning". An implementation may choose to omit some  
 2273 or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that  
 2274 prevents a job from completing, though in some cases the output may be of lower quality.

2275 **'-error'**: This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this  
 2276 attribute contains one or more errors, printer MUST be in the stopped state.

2277 If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an  
 2278 "error".

2279 If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the  
 2280 output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a  
 2281 warning in the Printer's "printer-state-reasons attribute". If the "printer-state" for such a Printer has a value of  
 2282 'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.

2283 The following standard keyword values are defined (in alphabetical order):

2284 **'other'**: The device has detected an error other than one listed in this document.

2285 **'none'**: There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without  
 2286 any value and MUST be used, since the 1setOf attribute syntax requires at least one value.

2287 **'connecting-to-device'**: The Printer object has scheduled a job on the output device and is in the process of  
 2288 connecting to a shared network output device (and might not be able to actually start printing the job  
 2289 for an arbitrarily long time depending on the usage of the output device by other servers on the  
 2290 network).

2291 **'cover-open'**: One or more covers on the device are open.

2292 **'deactivated'**: A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]  
 2293 section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.  
 2294 The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-  
 2295 Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URI (so that partial job submission can  
 2296 be completed - see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status  
 2297 code.

2298 **'developer-empty'**: The device is out of developer.

2299 **'developer-low'**: The device is low on developer.

2300 **'door-open'**: One or more doors on the device are open.

2301 **'fuser-over-temp'**: The fuser temperature is above normal.

2302 **'fuser-under-temp'**: The fuser temperature is below normal.

2303 **'hold-new-jobs'**: The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or  
 2304 other means, but the output-device(s) are taking an appreciable time to stop. Later, when all output  
 2305 has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-  
 2306 paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-  
 2307 New-Jobs operation is supported and the implementation takes significant time to pause a device in  
 2308 certain circumstances.

2309 **'input-tray-missing'**: One or more input trays are not in the device.

2310 **'interlock-open'**: One or more interlock devices on the printer are unlocked.

2311 **'interpreter-resource-unavailable'**: An interpreter resource is unavailable (i.e. font, form)

- 2312 **'marker-supply-empty'**: The device is out of at least one marker supply. (e.g. toner, ink, ribbon)
- 2313 **'marker-supply-low'**: The device is low on at least one marker supply. (e.g. toner, ink, ribbon)
- 2314 **'marker-waste-almost-full'**: The device marker supply waste receptacle is almost full.
- 2315 **'marker-waste-full'**: The device marker supply waste receptacle is full.
- 2316 **'media-empty'**: At least one input tray is empty.
- 2317 **'media-jam'**: The device has a media jam.
- 2318 **'media-low'**: At least one input tray is low on media.
- 2319 **'media-needed'**: A tray has run out of media.
- 2320 **'moving-to-paused'**: Someone has paused the Printer object using the Pause-Printer operation (see  
2321 [rfc2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.  
2322 Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value  
2323 replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be  
2324 supported, if the Pause-Printer operation is supported and the implementation takes significant time  
2325 to pause a device in certain circumstances.
- 2326 **'opc-life-over'**: The optical photo conductor is no longer functioning.
- 2327 **'opc-near-eol'**: The optical photo conductor is near end of life.
- 2328 **'output-area-almost-full'**: One or more output area is almost full (e.g. tray, stacker, collator).
- 2329 **'output-area-full'**: One or more output area is full. (e.g. tray, stacker, collator)
- 2330 **'output-tray-missing'**: One or more output trays are not in the device
- 2331 **'paused'**: Someone has paused the Printer object using the Pause-Printer operation (see [rfc2911] section  
2332 3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer  
2333 MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a  
2334 Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that  
2335 job when the Printer is no longer paused and leave no evidence in the printed output of such a  
2336 pause. This value MUST be supported, if the Pause-Printer operation is supported.
- 2337 **'shutdown'**: Someone has removed a Printer object from service, and the device may be powered down or  
2338 physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the  
2339 Printer object is realized by a print server that is still active, the Printer object MUST perform no other  
2340 operations requested by a client, including returning this value. If a Printer object had been printing a  
2341 job when it was shutdown, the Printer ~~NEED NOT MAY~~ resume printing that job when the Printer is  
2342 no longer shutdown. If the Printer resumes printing such a job, it ~~may MAY~~ leave evidence in the  
2343 printed output of such a shutdown, e.g. the part printed before the shutdown ~~may MAY~~ be printed a  
2344 second time after the shutdown.
- 2345 **'spool-area-full'**: The limit of persistent storage allocated for spooling has been reached. The Printer is  
2346 temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept  
2347 more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small  
2348 number jobs at a time or a spooling Printer that has filled the spool space.
- 2349 **'stopped-partly'**: When a Printer object controls more than one output device, this reason indicates that one  
2350 or more output devices are stopped. If the reason is a report, fewer than half of the output devices  
2351 are stopped. If the reason is a warning, fewer than all of the output devices are stopped.
- 2352 **'stopping'**: The Printer object is in the process of stopping the device and will be stopped in a while. When  
2353 the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The  
2354 'stopping-warning' reason is never an error, even for a Printer with a single output device. When an  
2355 output-device ceases accepting jobs, the Printer will have this reason while the output device  
2356 completes printing.



- 2377 1. MUST meet the conformance requirements for Printers specified in [rfc2911].
- 2378 2. MUST support the Create-Job operation as specified in [rfc2911], even though [rfc2911] does not REQUIRE a  
2379 Printer ~~NEED NOT to~~ support the Create-Job operation in order to conform to [rfc2911].
- 2380 3. MUST support the Document operations that section 3 REQUIRES a Printer to support.
- 2381 4. MUST support the Close-Job Job operation as defined in section 4.3.
- 2382 5. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI  
2383 operation that section 6 REQUIRES a Printer to support.
- 2384 6. MUST support the “document-format-details” Operation attribute (section 6.1.2) and the corresponding  
2385 “document-format-details” Document Description attribute (section 8.2.9) along with the “document-format-  
2386 details-supported” (section 9.2) and “document-format-details-implemented (section 9.3) Printer attributes, if  
2387 the Printer supports a container document format, such as application/zip or multipart/related MIME types.
- 2388 7. MAY support any of the Document Template attributes in Document Creation operations as indicated in  
2389 section 7 and MUST NOT support them for contexts for where they are not defined as indicated in the Table  
2390 10 with an “n”.
- 2391 8. MUST support the Document Description attributes that section 8 REQUIRES a Printer to support.
- 2392 9. MUST support the Printer attributes that section 8.2.1 REQUIRES a Printer to support.
- 2393 10. MUST support the values of Printer Descriptions attribute that section 10 REQUIRES a Printer to support.

## 2394 12.2 Client conformance requirements

2395 In order to conform to this specification, a client:

- 2396 1. MUST meet the conformance requirements for clients specified in [rfc2911]
- 2397 2. MAY support any of the Document operations defined in section 3.
- 2398 3. MUST supply the Operation attributes that section 6 REQUIRES a client to supply in operation requests.
- 2399 4. MUST supply any Document Template attributes in the format that section 7 REQUIRES a client to supply in  
2400 Document Creation operations and MUST NOT support them for contexts for where they are not defined as  
2401 indicated in the Table 10 with an “n”.
- 2402 5. SHOULD support any of the Document Description attributes that section 8 REQUIRES a Printer to support.
- 2403 6. MAY support any of the Printer attributes listed in section 8.2.1.
- 2404 7. MAY support any of the values of the Printer Descriptions attributes in section 10.

2405 **13 Normative References**

2406 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols  
 2407 below, rather than the RFC number (except for [rfc2910] and [rfc2911]). IETF RFCs and IANA registrations require  
 2408 using the RFC numbers in the body of the document for references.

2409 [adm-ops]

2410 Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol (IPP): Job and Printer Administrative  
 2411 Operations", <draft-ietf-ipp-ops-set2-03.txt>, July 17, 2001.

2412 [~~col~~rfc3382]

2413 deBry, R., Hastings, T., Herriot, R., Ocke, K., and P. Zehler, "Internet Printing Protocol (IPP): The 'collection'  
 2414 attribute syntax", <~~draft-ietf-ipp-collection-05.txt~~>, work in progress RFC 3382, July 17, 2001 September 2002.

2415 [ippsave] Hastings, T., and D. Fullman, "Internet Printing Protocol (IPP): Production Printing Attributes - Set 2", to  
 2416 become a PWG IEEE-ISTO standard, work in progress, August 21, 2002,  
 2417 ftp://ftp.pwg.org/pub/pwg/ipp/new\_PPE/pwg-ipp-pwg5100.3-set2-draft-v0\_1-020821.pdf.

2418 [pwg5100.1]

2419 Hastings, T., Fullman, D., "Internet Printing Protocol (IPP): "finishings" attribute values extension", IEEE-ISTO  
 2420 5100.1-2001, February 5, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.1.pdf

2421 [get-method]

2422 Herriot, R., and T. Hastings, "Internet Printing Protocol (IPP): The 'ippget' Delivery Method for Event  
 2423 Notifications", <draft-ietf-ipp-notify-get-08.txt>, September 5, 2002.

2424 [rfc3381]

2425 Hastings, T., Lewis, H., and R. Bergman, "Internet Printing Protocol (IPP): Job Progress Attributes",  
 2426 RFC3381, September 2002.

2427 [pwg5101.1]

2428 IEEE-ISTO PWG 5101.1-2002, "The Printer Working Group Standard for Media Standardized Names", 26  
 2429 February 2002, ftp://ftp.pwg.org/pub/pwg/standards/pwg5101.1.pdf, .doc, .rtf

2430 [not-srv]

2431 Hastings, T., Lewis, H, and Ira McDonald, "Distributed Notification Server", September 26, 2002, work in  
 2432 progress to become IEEE-ISTO 5100.6-2002, ftp://ftp.pwg.org/pub/pwg/ipp/new\_NOT/ipp-dist-not-service-  
 2433 020926.doc

2434 [ntfy]

2435 Herriot, R., Hastings, T., Shepherd, M., deBry, R., Isaacson, S., Martin, J., and R. Bergman, "Internet Printing  
 2436 Protocol/1.1: Event Notifications and Subscriptions", <draft-ietf-ipp-not-spec-08.txt>, November 19, 2001.

2437 [pwg5100.2]

2438 Hastings, T., and R. Bergman, "Internet Printing Protocol (IPP): output-bin attribute extension", IEEE-ISTO  
 2439 5100.2-2001, February 7, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf.

- 2440 [pwg5100.4]  
2441 Herriot, R., Ocke, K., "Internet Printing Protocol (IPP): Override Attributes for Documents and Pages", IEEE-  
2442 ISTO 5100.4-2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf>.
- 2443 [pwg5100.3]  
2444 Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO  
2445 5100.3-2001, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>.
- 2446 [rfc2911]  
2447 R. deBry, T. Hastings, R. Herriot, S. Isaacson, P. Powell, "Internet Printing Protocol/1.1: Model and  
2448 Semantics", RFC 2911, September 2000.
- 2449 [rfc3380]  
2450 Hastings, T., Herriot, R., Kugler, C., and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set  
2451 Operations", RFC 3380, September 2002.
- 2452 [upnp]  
2453 Microsoft, "Basic *PrintBasic:1.0* Service Template Version 1.01 For Universal Plug and Play Version 1.0"

## 2454 14 Informative References

- 2455 [fsg-jt]  
2456 Free Software Group, Open Printing Job Ticket API, Visit: <http://www.freestandards.org/openprinting/>
- 2457 [pwg-psi]  
2458 "Print Service Interface (PSI)", work in progress to become a PWG IEEE-ISTO standard. Visit  
2459 <http://www.pwg.org/>.
- 2460 [pwg-sm]  
2461 Zehler, P., and S. Albright, "PWG Semantic Model", work in progress to become a PWG IEEE-ISTO standard,  
2462 version 0.11, September 27, 2002. <ftp://ftp.pwg.org/pub/pwg/Semantic-Model/PWG-Semantic-Model.pdf>
- 2463 [rfc2565]  
2464 Herriot, R., Butler, S., Moore, P., and R. Turner, "Internet Printing Protocol/1.0: Encoding and Transport",  
2465 RFC 2565, April 1999.
- 2466 [rfc2566]  
2467 R. deBry, T. Hastings, R. Herriot, S. Isaacson, and P. Powell, "Internet Printing Protocol/1.0: Model and  
2468 Semantics", RFC 2566, April 1999.
- 2469 [rfc2567]  
2470 Wright, D., "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999.
- 2471 [rfc2568]  
2472 Zilles, S., "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol", RFC 2568,  
2473 April 1999.

2474 [rfc2569]  
 2475 Herriot, R., Hastings, T., Jacobs, N., Martin, J., "Mapping between LPD and IPP Protocols", RFC 2569, April  
 2476 1999.

2477 [rfc2616]  
 2478 R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, "Hypertext Transfer  
 2479 Protocol - HTTP/1.1", RFC 2616, June 1999.

2480 [rfc3196]  
 2481 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1: Implementer's  
 2482 Guide", RFC 3196, November 2001.

2483 [rfc3239]  
 2484 Kugler, C., Lewis, H. and T. Hastings, "Internet Printing Protocol (IPP): Requirements for Job, Printer, and  
 2485 Device Administrative Operations", RFC 3239, February 2002.

2486 **15 IANA Considerations**

2487 This section contains the registration information for IANA to add to the various IPP Registries according to the  
 2488 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting  
 2489 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

2490 *Note to the RFC Editor: Replace the References below to [this spec] with the RFC number for the appropriate*  
 2491 *document, so that it accurately reflects the content of the information for the IANA Registry.*

2492 **15.1 Attribute Registrations**

2493 The following table lists all the attributes defined in this specification. These are to be registered according to the  
 2494 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this  
 2495 specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also  
 2496 being Document Template attributes. However, the definitions of these Document Template attributes are not  
 2497 duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 7 which contains  
 2498 a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).  
 2499 This table contains the reference in another specification that completely defines each attribute. These Document  
 2500 Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a  
 2501 reference to this specification and Section 7.

Attribute Name (attribute syntax)	Reference	Section
Document Description attributes:		
attributes-charset (charset)	[this spec]	8.2.1
attributes-natural-language (naturalLanguage)	[this spec]	8.2.2
compression (type3 keyword)	[this spec]	8.2.3
current-page-order (type2 keyword)	[this spec]	8.2.4
date-time-at-completed (dateTime)	[this spec]	8.2.5
date-time-at-creation (dateTime)	[this spec]	8.2.6
date-time-at-processing (dateTime)	[this spec]	8.2.7
detailed-status-message (1setOf text (MAX))	[this spec]	8.2.25
document-access-errors (1setOf text (MAX))	[this spec]	8.2.26

2515	document-format (mimeMediaType)	[this spec]	8.2.8
2516	document- <del>format-details</del> <del>container</del> <del>summary</del> (collection)	[this spec]	8.2.9
2517			
2518	document-creator-application-name (name(MAX))	[this spec]	6.1.2.1
2519	document-creator-application-version (text(127))	[this spec]	6.1.2.2
2520			
2521	document-creator-os-name (name(40))	[this spec]	6.1.2.3
2522	document-creator-os-version (text(40))	[this spec]	6.1.2.4
2523	document-format (mimeMediaType)	[this spec]	6.1.2.5
2524	document-format-device-id (text(127))	[this spec]	6.1.2.6
2525	document-format-version (text(127))	[this spec]	6.1.2.7
2526	document-natural-language (naturalLanguage)	[this spec]	6.1.2.8
2527	<del>document-creator-application-name (name(MAX))</del>	<del>[this spec]</del>	<del>6.1.2.1</del>
2528	<del>document-creator-application-version (text(127))</del>	<del>[this spec]</del>	<del>6.1.2.2</del>
2529	<del>document-creator-os-name (name(40))</del>	<del>[this spec]</del>	<del>6.1.2.3</del>
2530	<del>document-creator-os-version (text(40))</del>	<del>[this spec]</del>	<del>6.1.2.4</del>
2531	<del>document-format-details-detected (1setOf collection)</del>		
2532		[this spec]	8.2.10
2533	document-format-detected (mimeMediaType)	[this spec]	8.2.11
2534	<del>document-format-device-id (text(127))</del>	<del>[this spec]</del>	<del>6.1.2.6</del>
2535	<del>document-format-version (text(127))</del>	<del>[this spec]</del>	<del>6.1.2.7</del>
2536	document-id-uri (uri)	[this spec]	8.2.12
2537	document-job-id (integer(1:MAX))	[this spec]	8.2.13
2538	document-job-printer-uri (uri)	[this spec]	8.2.14
2539	document-job-uri (uri)	[this spec]	8.2.15
2540	document-message (text(MAX))	[this spec]	8.2.16
2541	document-name (name(MAX))	[this spec]	8.2.17
2542	document-natural-language (naturalLanguage)	[this spec]	8.2.18
2543	document-number (integer(0:MAX))	[this spec]	8.2.19
2544	document-state (type1 enum)	[this spec]	8.2.20
2545	document-state-message (text(MAX))	[this spec]	8.2.21
2546	document-state-reasons (1setOf type2 keyword)	[this spec]	8.2.22
2547	document-uri (uri)	[this spec]	8.2.23
2548	impressions (integer(0:MAX))	[this spec]	8.2.27
2549	impressions-completed (integer(0:MAX))	[this spec]	8.2.28
2550	impressions-completed-current-copy (integer(0:MAX))		
2551		[this spec]	8.2.24
2552	k-octets (integer(0:MAX))	[this spec]	8.2.29
2553	k-octets-processed (integer(0:MAX))	[this spec]	8.2.30
2554	last-document (boolean)	[this spec]	8.2.36
2555	media-sheets (integer(0:MAX))	[this spec]	8.2.31
2556	media-sheets-completed (integer(0:MAX))	[this spec]	8.2.32
2557	more-info (uri)	[this spec]	8.2.33
2558	output-device-assigned (name(127))	[this spec]	8.2.37
2559	printer-up-time (integer (1:MAX))	[this spec]	8.2.34
2560	sheet-completed-copy-number (integer(0:MAX))	[this spec]	8.2.38

2561	time-at-completed (integer (MIN:MAX))	[this spec]	8.2.39
2562	time-at-creation (integer (MIN:MAX))	[this spec]	8.2.40
2563	time-at-processing (integer (MIN:MAX))	[this spec]	8.2.41
2564	warnings-count (integer(0:MAX))	[this spec]	8.2.35
2565			
2566			
2567	Document Templates attributes:		
2568	<del>ISSUE 15: TBD ACTION (Tom) - Need to add the xxx-default and xxx-</del>		
2569	<del>supported for each.</del>		
2570	copies (integer(1:MAX))	[this spec]	7
2571	cover-back (collection)	[this spec]	7
2572	cover-type (type2 keyword)	[this spec]	7
2573	media (type3 keyword   name(MAX))	[this spec]	7
2574	media-col (collection)	[this spec]	7
2575	cover-front (collection)	[this spec]	7
2576	cover-type (type2 keyword)	[this spec]	7
2577	media (type3 keyword   name(MAX))	[this spec]	7
2578	media-col (collection)	[this spec]	7
2579	feed-orientation (type3 keyword)	[this spec]	7
2580	finishings (1setOf type2 enum)	[this spec]	7
2581	finishings-col (collection)	[this spec]	7
2582	finishing-template (name(MAX))	[this spec]	7
2583	stitching (collection)	[this spec]	7
2584	stitching-locations (1setOf integer(0:MAX))	[this spec]	7
2585	stitching-offset (integer (0:MAX))	[this spec]	7
2586	stitching-reference-edge (type2 keyword)	[this spec]	7
2587	font-name-requested (name(MAX))	[this spec]	7
2588	font-size-requested (integer(1:MAX))	[this spec]	7
2589	force-front-side (1setOf integer(1:MAX))	[this spec]	7
2590	imposition-template (type2 keyword   name(MAX))	[this spec]	7
2591	insert-sheet (1setOf collection)	[this spec]	7
2592	insert-after-page-number (integer(0:MAX))	[this spec]	7
2593	insert-count (integer(0:MAX))	[this spec]	7
2594	media (type3 keyword   name(MAX))	[this spec]	7
2595	media-col (collection)	[this spec]	7
2596	media (type3 keyword   name(MAX))	[this spec]	7
2597	media-col (collection)	[this spec]	7
2598	media-back-coating (type3 keyword   name(MAX))	[this spec]	7
2599	media-color (type3 keyword   name(MAX))	[this spec]	7
2600	media-front-coating (type3 keyword   name(MAX))	[this spec]	7
2601	media-hole-count (integer(0:MAX))	[this spec]	7
2602	media-info (text(255))	[this spec]	7
2603	media-key (type3 keyword   name(MAX))	[this spec]	7
2604	media-order-count (integer(1:MAX))	[this spec]	7
2605	media-preprinted (type3 keyword   name(MAX))	[this spec]	7
2606	media-recycled (type3 keyword   name(MAX))	[this spec]	7

2607	media-size (collection)	[this spec]	7
2608	x-dimension (integer(0:MAX))	[this spec]	7
2609	y-dimension (integer(0:MAX))	[this spec]	7
2610	media-type (type3 keyword   name(MAX))	[this spec]	7
2611	media-weight-metric (integer(0:MAX))	[this spec]	7
2612	media-input-tray-check (type3 keyword   name(MAX))		
2613		[this spec]	7
2614	number-up (integer(1:MAX))	[this spec]	7
2615	orientation-requested (type2 enum)	[this spec]	7
2616	output-bin (type2 keyword   name(MAX))	[this spec]	7
2617	page-delivery (type2 keyword)	[this spec]	7
2618	page-order-received (type2 keyword)	[this spec]	7
2619	page-overrides (1setOf collection)	[this spec]	7
2620	document-copies (1setOf rangeOfInteger(MAX))	[this spec]	7
2621	input-documents (1setOf rangeOfInteger(MAX))	[this spec]	7
2622	output-documents (1setOf rangeOfInteger(MAX))	[this spec]	7
2623	pages (1setOf rangeOfInteger(MAX))	[this spec]	7
2624	<any other Job Template attributes that affect pages,		
2625	such as media or media-col>		
2626	page-ranges (1setOf rangeOfInteger(1:MAX))	[this spec]	7
2627	pages-per-subset (1setOf integer(1:MAX))	[this spec]	7
2628	presentation-direction-number-up (type2 keyword)	[this spec]	7
2629	print-quality (type2 enum)	[this spec]	7
2630	printer-resolution (resolution)	[this spec]	7
2631	separator-sheets (collection)	[this spec]	7
2632	media (type3 keyword   name(MAX))	[this spec]	7
2633	media-col (collection)	[this spec]	7
2634	separator-sheets-type (type3 keyword   name(MAX))		
2635		[this spec]	7
2636	sheet-collate (type2 keyword)	[this spec]	7
2637	sides (type2 keyword)	[this spec]	7
2638	x-image-position (type2 keyword)	[this spec]	7
2639	x-image-shift (integer(MIN:MAX))	[this spec]	7
2640	x-side1-image-shift (integer(MIN:MAX))	[this spec]	7
2641	x-side2-image-shift (integer(MIN:MAX))	[this spec]	7
2642	y-image-position (type2 keyword)	[this spec]	7
2643	y-image-shift (integer(MIN:MAX))	[this spec]	7
2644	y-side1-image-shift (integer(MIN:MAX))	[this spec]	7
2645	y-side2-image-shift (integer(MIN:MAX))	[this spec]	7
2646			
2647			
2648	Job Template attributes:		
2649	<del>ISSUE 16: TBD</del> ACTION (Tom) - Need to add the xxx-default and xxx-		
2650	supported.		
2651	job-copies (integer(1:MAX))	[this spec]	7.1.1
2652	job-cover-back (collection)	[this spec]	7.1.2

```

2653     <member attributes are the same as "cover-back">
2654 job-cover-front (collection) [this spec] 7.1.3
2655     <member attributes are the same as "cover-front">
2656 job-finishings (1setOf type2 enum) [this spec] 7.1.4
2657 job-finishings-col (1setOf collection) [this spec] 7.1.5
2658     <member attributes are the same as "finishings-col">
2659 media-size-name (type3 keyword | name(MAX)) [this spec] 7.1.6
2660 media-type (type3 keyword | name(MAX)) [this spec] 7.1.7
2661
2662
2663 Printer Description attributes:
2664 document-creation-attributes-supported (1setOf type2 keyword)
2665 [this spec] 9.1
2666
2667
2668 Operation attributes:
2669 document-message (text(MAX)) [this spec] 3.8.1.1
2670 job-mandatory-attributes (1setOf type2 keyword) [this spec] 4.4.2
2671 last-document (boolean) [this spec] 3.1.1.1+
2672

```

## 2673 15.2 Keyword attribute values

2674 **ISSUE 17: TBD - ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values**  
 2675 **registered for corresponding attributes.**

## 2676 15.3 Enum Attribute Values

2677 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.  
 2678 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

Value	Name	Reference	Section:
-----	-----	-----	-----
document-state	(type1 enum)	[this spec]	8.2.20
3	pending	[this spec]	8.2.20
5	processing	[this spec]	8.2.20
7	canceled	[this spec]	8.2.20
8	aborted	[this spec]	8.2.20
9	completed	[this spec]	8.2.20
job-finishings	(1setOf type2 enum)	[this spec]	7.1.4
<enum values are the same as "finishings">			
operations-supported	(type2 enum)	[rfc2911]	4.4.15
0x000F	Close-Job	[this spec]	4.3
0x0033	Cancel-Document	[this spec]	3.8
0x0034	Get-Document-Attributes	[this spec]	3.5

2696	0x0035	Get-Documents	[this spec]	3.6
2697	0x0036	Delete-Document	[this spec]	3.9
2698	0x0037	Set-Document-Attributes	[this spec]	3.7
2699	0x0039	Create-Document	[this spec]	3.1
2700	0x003A	Send- <del>Document</del> -Data	<u>                    </u>	[this spec]

2701 3.2  
2702

2703 **15.4 Operations**

2704 The following table lists all of the operations defined in this document. These are to be registered according to the  
2705 procedures in RFC 2911 [rfc2911] section 6.4.  
2706

2707	Operations	Reference	Section
2708	-----	-----	-----
2709	Cancel-Document	[this spec]	3.8
2710	Close-Job	[this spec]	4.3
2711	Create-Document	[this spec]	3.1
2712	Delete-Document	[this spec]	3.9
2713	Get-Document-Attributes	[this spec]	3.5
2714	Get-Documents	[this spec]	3.6
2715	Send- <del>Document</del> -Data	<u>                    </u>	[this spec]
2716	3.2		
2717	Set-Document-Attributes	[this spec]	3.7

2719 **15.5 Attribute Group tags**

2720 The following table lists all the attribute group tags defined in this document. These are to be registered according to  
2721 the procedures in RFC 2911 [rfc2911] section 6.5.

2722	Value	Name	Reference	Section
2723	-----	-----	-----	-----
2724	0x09	document-attributes-tag	[this spec]	11

2726 **16 Internationalization Considerations**

2727 The internationalization considerations for this extension for handling the Document object are the same as for  
2728 handling the Job object in [rfc2911].

2729 **17 Security Considerations**

2730 The Document object should provide no more increased security considerations than the Job object. The Printer  
2731 MUST provide the same access control for Document objects as for Job objects.

2732 **18 Contributors**

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2735 **19 Acknowledgments**

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2755 **21 Appendix A: Document operations compared to Job operations**

2756 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2757 Table 18 compares the Job and Document operations. The two Conf. columns indicate the conformance  
2758 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"  
2759 in the Document Conformance column means if the Document object is supported. Whether a Document operation  
2760 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part  
2761 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-  
2762 based protocols, APIs, and implementations.

2763 **Table 18 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
<b>Cancel-Current-Job</b>	OPT	<i>N/A, can only cancel a document explicitly by document number and explicit job id.</i>	OPT
<b>Cancel-Job</b>	REQ	<b>Cancel-Document</b>	REQ
<b>Create-Job</b>	OPT	<b>Create-Document</b>	REQ
<b>Get-Job-Attributes</b>	REQ	<b>Get-Document-Attributes</b>	REQ
<b>Get-Jobs</b>	REQ	<b>Get-Documents</b>	REQ
<b>Hold-Job</b>		<i>N/A, can only hold an entire job.</i>	

Job operations	Job Conf.	Document operations	Doc Conf
<b>Print-Job</b>	REQ	<b>Send-Document</b> (existing operation - see [rfc2911] with an additional Document attributes group defined in section 3.3)	REQ <sup>60</sup>
<b>Print-URI</b>	OPT	<b>Send-URI</b> (existing operation - see [rfc2911] with an additional Document attributes group defined in section 3.4)	OPT
N/A		<b>Send-Document-Data</b>	REQ
<b>Promote-Job</b>	OPT	N/A, can only promote an entire job	
<b>Purge-Jobs</b>	OPT	<b>Delete-Document</b>	OPT
<b>Release-Held-New-Jobs</b>	OPT	N/A, can only release entire jobs	
<b>Release-Job</b>	OPT	N/A, can only release an entire job	
<b>Reprocess-Job</b>	OPT	N/A, can only reprocess an entire job	
<b>Restart-Job</b>	OPT	N/A, can only restart an entire job	
<b>Resume-Job</b>	OPT	N/A, can only resume an entire job	
<b>Schedule-Job-After</b>	OPT	N/A, can only schedule an entire job	
<b>Set-Job-Attributes</b>	OPT	<b>Set-Document-Attributes</b>	OPT
<b>Suspend-Current-Job</b>	OPT	N/A, can only suspend an entire job in order to run another one	
<b>Validate-Job</b>	REQ	N/A, use Validate-Job to validate a single document or use Create-Job with "ipp-attribute-fidelity" = 'true' and Create-Document request to validate a multi-document job.	REQ

2764  
2765

## 22 Annex B: Change Log (informative)

The following summaries of the changes in chronological order:

Version 0.3, 9 September 2002:

1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
2. Added "original-requesting-user-name" Operation attribute to Table 6.
3. Added "y" to "output-bin" in Table 9 so it MAY be a Document Template attribute.
4. Clarified the \* and in Table 10 - Job and Document Description attributes.
5. Added section 8.2.1 all of the Printer attributes defined In any IPP standard.
6. Allocated operation-id enums in section 10 to the 7 Document operations.
7. Added the conformance section 12
8. Completed the IANA Considerations section 15.

Version 0.4, 14 October 2002:

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

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

<sup>60</sup> The Send-Document operation is OPTIONAL for a Printer to conform to [rfc2911], but is REQUIRED for a Printer to conform to this Document object specification.

1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by the PWG Last Call to progress as a Draft Standard.
2. Changed Cancel-Documents from OPTIONAL to REQUIRED.
3. Added Table 3 and Table 4 to show the request and response signatures of the Document Creation and Validation operations.
4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4] and because the Document object is really the Input Document (as opposed to the Output Document). The Printer copies this value to the Document's "document-number" Document Description attribute.
5. Clarified that the Printer MUST reject a Create-Documents request if the "document-number" already exists.
6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the "document-message" agreement (see point #15).
8. Fixed Create-Documents response to return Job status attributes in Group 3 and Document status attributes in Group 4.
9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description attribute in a Document Creation response.
10. Added the "document-mandatory-attributes" Operation attribute.
11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job Attributes and the other Document attributes.
12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.
14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number" and "document-id-uri" to be parallel with the Get-Jobs operation.
15. Changed the "message" Operation attribute in Cancel-Documents and Cancel-Current-Documents to "document-message" Operation attribute which the Printer copies to the "document-message" Document Description attribute for use both by the user and the operator.
16. Clarified that the "document-state-reasons" values never affect Job scheduling.
17. Made Job Level - page override programming higher precedence than Document level Document object attributes.
18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-requested".
19. In Table 6, flagged the Operation attributes that the Printer copies to the corresponding Job and Document Description attributes in Document Creation operations.
20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have "document-mandatory-attributes" Operation attribute.
21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages across Input-Documents.
23. Disallowed "page-ranges" at the Page Level.
24. Disallowed "pages-per-subset" at the Document level (and Page Level).
25. Disallowed "separator-sheets" at the Page Level.
26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-Jobs and Get-Job-Attributes.

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

1. Deleted the Cancel-Current-Documents and Validate-Documents operations.
2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.
3. Deleted the "document-mandatory-attributes" Operation attribute to align with the PWG Semantic model. So both specifications have only the "job-mandatory-attributes" Operation attribute. The client can only supply at the Job Level. The Document Level inherits from the Job Level.
4. Increased "document-message" Operation attribute length from 127 to MAX (1023) octets.
5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the Document level inherits their values.

- 2843 6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
- 2844 7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute
- 2845 as used by UPnPv1 and UPnPv2.
- 2846 8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and
- 2847 UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template
- 2848 attributes).
- 2849 9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
- 2850 10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
- 2851 11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
- 2852 12. Added the following Document Description attributes: "document-format-detail", "document-format-detected",
- 2853 "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
- 2854 13. Defined all of the Document Description attributes, often with references to other specifications, so that they
- 2855 appear in the table of contents.
- 2856

Version 0.7<sup>6</sup>, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:

- 2857 1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
- 2858 2. Updated the Abstract and Introduction to reflect the additions.
- 2859 3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
- 2860 4. Deprecated the "input-document-number" Operation attribute ([pwg5100.4] section 9.2.1 in the Create-
- 2861 Document Requests
- 2862 5. Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.
- 2863 6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using "last-
- 2864 document" still works too and the Printer MUST support both ways.
- 2865 7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation
- 2866 operation to the Document object as observable in Document object query responses. Document objects
- 2867 inherit that effect from the Job object.
- 2868 8. Added the following operation and Document Description attributes: document-container-summary
- 2869 (collection), document-creator-application-name (name(MAX)), document-creator-application-version
- 2870 (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-
- 2871 format-device-id (text(127)), document-format-version (text(127)). The "document-container-summary"
- 2872 collection attribute may contain them, plus "document-format" and "document-natural-language".
- 2873 9. REQUIRED Printers to support "document-format-version" Document Description.
- 2874 10. Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4] without
- 2875 "document-overrides".
- 2876 11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with
- 2877 "document-" so that no Document attribute has a "job-" prefix: "job-printer-uri" becomes "document-job-
- 2878 printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
- 2879 12. Added the encoding for the "document-attributes-tag" as 0x09.
- 2880 13. Updated the IANA Registration section, but still needs more work.

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

- 2883 1. Changed the name of the Send-Document-Data back to Send-Data to keep the name short. There wasn't
- 2884 support for keeping the name of the object affected in the name of the operation.
- 2885 2. Changed "job-mandatory-attributes" operation/Job Description attribute so that a Printer MUST support it.
- 2886 3. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using
- 2887 "pages-per-subset" and "page-overrides".
- 2888 4. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as
- 2889 an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward
- 2890 compatibility.
- 2891 5. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if
- 2892 present.
- 2893 6. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first
- 2894 collection value.
- 2895 7. Added "document-format-details-detected (1setOf collection) Document Description attribute.
- 2896 8. Clarified that "document-natural-language" identifies the primary or first language if a Document contains
- 2897 more than one language.

- 2898 | 9. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
- 2899 | 10. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
- 2900 | 11. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords)
- 2901 | Printer Description attribute.
- 2902