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2 Maturity Level: Development ²⁻²ISSUES are highlighted like this.

3 Important information to review is highlighted like this.

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5 The Printer Working Group (PWG)

6 Standard for

7 The Internet Printing Protocol (IPP):

8 Document Object

9

10 **Abstract:** This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a
11 Document object. The [rfc2911] Job object is extended to contain one or more Document objects that are passive
12 objects operated on by the Job. Multi-Document Jobs exist in IPP [rfc2911] but are not objects in their own right.
13 This specification elevates the Document to an IPP object thus giving access to a document's metadata within a Job.
14 A Document object allows template attributes to be applied at both the Job and Document level. This enables
15 document overrides of Job Template attributes.

16 This specification defines [new operations](#) or extends RFC2911 operations as follows:

17 [1 RFC 2911 operation that creates a Job object: Create-Job](#)

18 ~~2 existing rfc~~RFC 2911 operations that create a Job and Document ~~object: or just a Job: PrintJob, CreateJob~~
19 ~~Print-URI~~

20 ~~2 extended rfc~~RFC 2911 operations that create Document ~~objects: Send-Document, Send-URI-Send-~~
21 ~~Document~~

22 5 new operations: Get-Documents, ~~r~~Get-Documents-Attributes, Set-Documents-Attributes, Cancel-Documents,
23 Delete-Documents

24 This specification ~~defines some~~uses the new Operation attributes ([defined in \[jobx\]](#)) that describe the contents of the
25 Document and permit the Printer to reject requests that it cannot process correctly [to define new Document](#)
26 [Description attributes](#). The Printer copies these Operation attributes to the corresponding Document Description
27 attributes, which clients may query.

28 This specification also uses existing Job Template attributes [as to define](#) Document Template attributes ("xxx"
29 Document attribute, "xxx-actual" Document Description, "xxx-default" Printer attribute, and "xxx-supported" Printer
30 attribute. In addition this specification lists all of the attributes defined in other IPP specifications to show their
31 relationship to corresponding attributes defined in this IPP specification for use with the Document object.

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



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

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

ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/wd-ippdoc2003051846.pdf, .doc, .rtf

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98 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open
99 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
100 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
101 standards.

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103 multiple, independent and interoperable implementations with substantial operational experience, and enjoys
104 significant public support.

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

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

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284

1 Introduction and Summary

285 This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object.
 286 The [rfc2911] Job object is extended to contain one or more Document objects that are passive objects operated on
 287 by the Job. [The REQUIRED Print-Job and OPTIONAL Print-URI operations \(\[rfc2911\] sections 3.2.1 and 3.2.2\)](#)
 288 [create a Job object containing a single Document object. The REQUIRED Create-Job operation \(\[rfc2911\] section](#)
 289 [3.2.4\) creates a Job object. The REQUIRED Send-Document and OPTIONAL Send-URI operations \(\[rfc2911\]](#)
 290 [section 3.3.1 and 3.3.2\) add a Document object to the specified Job object. The Job object is created by the](#)
 291 [REQUIRED Print-Job or the OPTIONAL Create-Job \(see \[rfc2911\] sections 3.2.2 and 3.2.4\) operations. The](#)
 292 [Document object is created by the REQUIRED Print-Job or the OPTIONAL Send-Document or the OPTIONAL Send-](#)
 293 [URI \(see \[rfc2911\] section 3.2.2, 3.3.1 and 3.3.2 respectively\) operations. This specification \[also\]\(#\) adds a Document
 294 Attributes group \(and tag\) to the Send-Document and Send-URI requests \[and responses\]\(#\). The Document Attributes
 295 group contains any Document Template attributes to be applied to this Document object being created, overriding
 296 any corresponding Job Template attribute supplied at the job level \[\\(by Create-Job\\) and thereby allowing the client to\]\(#\)
 297 \[vary the Document Template attributes between Document objects in a single Job. A new OPTIONAL Create-\]\(#\)
 298 \[Document operation allows a client to supply the Document Attributes without the data \\(like Create-Job does for a\]\(#\)
 299 \[Job object\\). Then the client sends the data content for that Document object using the new OPTIONAL Send-Data\]\(#\)
 300 \[operation.\]\(#\)](#)

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

- 303 1 REQUIRED Job operation: Get-Documents [ISSUE01: Should Close-Job \[jobx\] be REQUIRED?](#)
- 304 1 REQUIRED Job and Document eCcreation operation: PrintJob [rfc2911]
- 305 1 OPTIONAL Job and Document Creation operation: Print-URI [rfc2911]
- 306 1 REQUIRED Document Creation operation: Send-Document [rfc2911]
- 307 2 OPTIONAL Document creation operation: Send-URI [rfc2911], ~~Send-Document [rfc2911],~~
- 308 2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
- 309 2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

310 This specification ~~defines some uses the~~ new Operation attributes [\(defined in \[jobx\]\)](#) that describe the contents of the
 311 Document and permit the Printer to reject requests that it cannot process correctly [to define new Document](#)
 312 [Description attributes](#). The Printer copies these Operation attributes to the corresponding Document Description
 313 attributes which client may query.

314 This specification also ~~defines most uses existing~~ Job Template attributes [as to define](#) Document Template attributes
 315 (“xxx” Document attribute, “xxx-actual” Document Description [ippact], “xxx-default” Printer attribute, and “xxx-
 316 supported” Printer attribute. In addition this specification lists all of the attributes defined in other IPP specifications¹
 317 to show their relationship to corresponding attributes defined in this IPP specification for use with the Document
 318 object. The full semantics of the “document-state”, “document-state-reasons”, and “document-state-message”
 319 Document Description attributes are given along side of the corresponding [rfc2911] “job-state”, “job-state-reasons”,
 320 and “job-state-message” Job Description attributes. Finally, the analogous Document Descriptions attributes that
 321 correspond to the Job Description attributes are defined.

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

¹ 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.

326 **1.1 Scope**

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

333 The Document object is a passive object² and is operated upon by the Job. The client uses ~~the new Create-~~
 334 ~~Document operation or~~ either of the existing Send-Document and Send-URI operations to create a Document object.
 335 In addition there are 8 new operations that affect the Document object after it has been created as summarized in
 336 ~~Table 1~~Table 4.

337 **Table 1 - Summary of operations**

Operation Name	Printer support	Brief Description
Print-Job [rfc2911]	REQUIRED	Creates a Job object as in [rfc2911] which contains a single Document object with pushed data in-line. Some additional Operation attributes are defined in this spec [jobx] for use in creating the Document object with Document Description attributes .
Print-URI [rfc2911]	OPTIONAL	Creates a Job object as in [rfc2911] which contains a single Document object with a reference to the document data. Some additional Operation attributes are defined in [jobx] this spec for use in creating the Document object with Document Description attributes .
Create-Job [rfc2911]	REQUIRED³	Creates the Job object as defined in [rfc2911] with Job Attributes. Job Template attributes that affect individual documents, such as “media”, are inherited by the Document objects that are subsequently created for the Job using Send-Document and/or Send-URI.
Send-Document [rfc2911]	REQUIRED ³	Creates a Document object with Document attributes and data. Some additional Operation attributes are defined in [jobx] this spec for use in creating the Document object with Document Description attributes , along with a new Document attributes group to pass Document Template attributes.
Send-URI [rfc2911]	OPTIONAL	Creates a Document object with Document attributes and a URL reference to the data (print-by-reference). Some additional Operation attributes are defined in [jobx] this spec for use in creating the Document object with Document Description attributes , along with a new Document attributes group to pass Document Template attributes.
Close-Job [jobx]	OPTIONAL	Closes the Job object that was created with Document objects.
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.

338 This specification ~~defines new uses existing~~ Operation attributes ~~that allow the client to provide hints⁴ or requirements~~
 339 ~~to the Printer about individual Document Object contents at request time as~~ summarized in ~~Table 2~~Table 2 to define
 340

² 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.

³ In [rfc2911] the Create-Job and Send-Document operations are OPTIONAL for a Printer to support.

341 | [new Document Description attributes](#). The Printer copies these Operation attributes supplied by the client in the
 342 | request to the corresponding Job or Document Description attributes.

343 | **Table 2 - Summary of New Operation/Description attributes**

Operation attribute	Creation operation	Printer support	Description
ipp-attribute-fidelity (boolean) *	Job	MUST	Allows the client to indicate whether or not the Printer MUST support all Job Template and Document Template attributes.
job-mandatory-attributes (1setOf type2 keyword)	Job	MUST	Allows the client to list which Job Template and Document Template attributes that the Printer MUST support.
document-charset (charset)	Document	CMUST ⁵	The charset of the Document Object content
document-digital-signature (type2 keyword)	Document	MAY	The type of digital signature, if any used in the Document Object content.
document-format (mimeType) *	Document	MUST	The document format of the Document Object content
document-format-details (1setOf collection)	Document	CMUST ⁶	The details of the Document Object content, including when its package of files (zip, multipart/related), such as application and operating system that created the document, the intended device type (when the format is device-dependent), the natural languages of the document.
document-format-version (text(127))	Document	MAY	The level or version of the document format.
document-natural-language (naturalLanguage) *	Document	MAY	The primary language of the Document Object content.

344 | * - indicates Operation attributes defined in [rfc2911] that are extended to apply to the Document Creation operations
 345 | defined in this specification.

346 | 2 Terminology

347 | This section defines terminology used throughout this document.

348 | 2.1 Conformance Terminology

349 | Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, and **OPTIONAL**, have
 350 | special meaning relating to conformance as defined in RFC 2119 [rfc2119]. If an implementation supports the
 351 | extension defined in this document, then these terms apply; otherwise, they do not. These terms define
 352 | conformance to *this document (and [rfc2911]) only*; they do not affect conformance to other documents, unless

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

⁵ The Printer MUST support the “document-charset” operation/Document Description attributes if the Printer supports a document-format in which the charset may be ambiguous in the Document content, such as ‘application/vnd.hp-PCL’ where the charset escape sequence MAY be omitted from the data (see section **Error! Reference source not found.**).

⁶ The Printer MUST support the “document-format-details” operation/Document Description attributes, if the Printer supports a packaging document format, such as ‘application/zip’ or ‘multipart/related’

353 explicitly stated otherwise. For example, the term REQUIRED in this document means “REQUIRED if this
354 OPTIONAL Document Object specification is implemented”.

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

357 2.2 Other Terminology

358 This document uses the same terminology as [rfc2911], such as “client”, “Printer”⁷, “attribute”, “attribute value”,
359 “keyword”, “Job Template attribute”, “Operation attribute”, “operation”, “request”, “response”, and “support”
360 with the same meaning. In addition, the following terms are defined for use in this document:

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

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

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

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

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

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

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

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

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

⁷ [rfc2911] uses the terms “Printer object” and “Printer” interchangeably to mean the same thing. For simplicity, this document uses the term “Printer” exclusively, except for definitions copied directly from [rfc2911]. None the less, the intent is as in [rfc2911]: a Printer is an object that MAY be hosted in the device or in a server as in [rfc2911].

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

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

400 [Table 3Table-3](#) shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both
 401 Job Creation operations and Document Creation operations, though they only create single Document jobs. In other
 402 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
 403 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a
 404 separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept,
 405 no operation supplies attributes at more than one level.⁸

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

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

407

⁸ 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. [In the \[pwg-sm\]](#), the Printer copies all of these client's supplied attributes to the Job or Document object. [\[pwg-sm\]](#) Read-only Job and Document attributes that the Printer sets are called Job Status and Document Status attributes (instead of Description attributes).

408 3 New Job operations and semantic extensions to Job operations

409 This section defines the semantic extensions to Job operations that affect Document objects. Printer and
 410 Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object and the
 411 Document object has no effect on the semantics of the Printer and Subscription operations. The Job operations that
 412 MUST NOT have any effect on the Document object because they are defined to affect the Job object as a whole
 413 are: **Get-Job-Attributes**⁹ ([rfc2911] section 3.3.4), **Get-Jobs**¹⁰ ([rfc2911] section 3.2.6), **Hold-Job** ([rfc2911] section
 414 3.3.5), **Release-Job** ([rfc2911] section 3.3.6), **Promote-Job** ([adm-ops] section 4.4.1), **Release-Held-New-Jobs**
 415 ([adm-ops] section 3.3.2), **Resume-Job** ([adm-ops] section 4.3.2), **Schedule-Job-After** ([adm-ops] section 4.4.2),
 416 **Set-Job-Attributes** ([rfc3380] section 4.2), and **Validate-Job** ([rfc2911] section 3.2.3).

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

419 3.1 Job Creation operations

420 This section defines the extensions to [the Job Creation operations](#).

421 ~~Note: Using the Get-Job-Attributes and Get-Documents-Attributes, a Job created by Print-Job will be indistinguishable~~
 422 ~~to a client from a Job created with Create-Job and Send-Document with no Document-Template attributes supplied.~~
 423 ~~Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted~~
 424 ~~the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and~~
 425 ~~Send-Document (with no Document-Template attributes supplied). However, if a new client supplies Document~~
 426 ~~Template attributes on the Send-Document, instead of the same attributes as Job-Template attributes on the Create-~~
 427 ~~Job, then an old client will not see any of the Document-Template attributes when it performs the Get-Job-Attributes~~
 428 ~~operation (since the Printer does not "copy up" Document-Template attributes to the Job-Level on a Get-Job-~~
 429 ~~Attributes-on-a-one-document-job~~

430 3.1.1 Operation Attributes

431 The following Operation attribute extensions have additional semantics when used with document objects. These
 432 attributes apply for all the Job Creation operations and Validate-Job:

433 3.1.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)

434 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1) when the
 435 client supplies unsupported Job Template or Document Template attributes¹¹ or value in a Job Creation operation or
 436 a subsequent Document Creation operation for this job. The value 'true' indicates that total fidelity to client supplied
 437 Job Template and Document Template attributes and values is required for this Job Creation operation and all
 438 subsequent Document Creation operations for this job. If the client supplies the value 'false' or omits the attribute,
 439 then the Printer MUST accept the Job Creation operation and all subsequent Document Creation operations even if
 440 the client supplies unsupported attributes or values in them.

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

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

¹¹ The value of the "ipp-attribute-fidelity" Operation attribute has no effect on other *Operation* attributes supplied by the client, only on Job Template and Document Template attributes supplied by the client.

441 The Printer MUST copy this attribute to the corresponding ~~(new)~~ Job Description attribute (see [\[jobx\]](#) section
 442 [6.1](#)~~Error! Reference source not found.~~) and use its value for validating subsequent Document Creation operations
 443 for this job.

444 Note: The inheritance of the effect of the “ipp-attribute-fidelity” Operation attribute by subsequent Document Creation
 445 operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting the
 446 behavior of the Document Level (see [Table 3](#)~~Table-3~~).

447 3.1.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute

448 This REQUIRED¹² Operation attribute identifies which Job Template and Document Template attributes the Printer
 449 MUST Honor in this Job Creation request and all subsequent Document Creation requests for this Job. ~~The Printer
 450 MUST reject this Job Creation operation or any subsequent Document Creation operations for this job, if the client
 451 supplies an unsupported Job Template or Document Template attribute or value in the request that is also identified
 452 in this list. The client MAY supply this attribute in a Job Creation operation. The Printer MUST support this attribute
 453 in Job Creation operations and the Validate Job operation.~~

454 A client MUST NOT supply this “job-mandatory-attributes” Operation attribute in a Document Creation operation. If a
 455 client does supply ~~the~~[this](#) attribute in a Document Creation operation, ~~the Printer MUST~~, the Printer MUST ignore
 456 and otherwise accept the request and return this attribute without any values in the Unsupported Attributes Group in
 457 the response (see [rfc2911] section 3.1.7). Thus the Printer only supports the “job-mandatory-attributes” Operation
 458 attribute supplied at the Job level. Thus the “job-mandatory-attributes” Operation attribute controls all other Job
 459 Template and Document Template attributes supplied at the Job Level and Document Level uniformly. Note: The
 460 inheritance of the effect of “job-mandatory-attributes” Operation attribute supplied at the Job Level by subsequent
 461 Document Creation operations is like the inheritance of Job Template attributes.

462 The Printer MUST copy this attribute to the corresponding “job-mandatory-attributes” Job Description attribute (see
 463 [\[jobx\]](#) section [6.3-3.1.1.2](#)) for auditing and trouble shooting purposes and use its value for validating subsequent
 464 Document Creation operations for this job.

465 Note: The inheritance of the effect of the “job-mandatory-attributes” Operation attribute by subsequent Document
 466 Creation operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting
 467 the behavior of the Document Level (see [Table 3](#)~~Table-3~~).

468 ~~The values of the “job-mandatory-attributes” attribute are the keyword-attribute names that identify Job Template
 469 and/or Document Template attributes, for example, ‘job-hold-until’, ‘job-finishings’ (see section [Error! Reference
 470 source not found.](#)), ‘copies’ and ‘media’. In order to identify a member attribute of a collection attribute, the keyword
 471 names of both the collection attribute and the member attribute are given separated by a period (.) character. For
 472 example, to make the “media” attribute of the “cover-front” collection attribute mandatory, supply the keyword value:
 473 ‘cover-front.media’.~~

474 ~~The Printer MUST accept any keyword values whether or not supported by the Printer. If the client supplies this “job-
 475 mandatory-attributes” Operation attribute in a Job Creation operation with values that represent Template attributes
 476 that the Printer doesn't support, the Printer MUST otherwise accept the attribute anyway. The Printer MUST reject
 477 this Job Creation or a subsequent Document Creation operation only if the client actually supplies any of the
 478 identified Template attributes that the Printer doesn't support. Because the Printer doesn't reject when the “job-
 479 mandatory-attributes” Operation attribute has the unsupported attribute keyword names, the client MAY supply all of
 480 the attribute keyword names that the client supports without having to tailor the list to the particular Printer that the
 481 client is submitting the Job Creation operation, thereby, simplifying client use of this attribute.~~

¹² The Printer MUST support the “job-mandatory-attributes” Operation/Job Description attributes for conformance to this Document Object specification. However, an implementation that isn't supporting the Document Object MAY still support the “job-mandatory-attributes” Operation attribute. See the definition of REQUIRED in section 2.1.

482 3.1.2 Create-Job ([rfc2911] section 3.2.4)

483 This REQUIRED¹³ operation creates the Job object with all of the mixture of Job and Document attributes supplied in
484 the Create-Job operation. All Operation attributes supplied affect the Job as a whole. The client supplies Job
485 Template attribute [rfc2911] that are a mixture of Job and Document attributes supplied together in the Job attribute
486 group in the request¹⁴. For example, such Job Template attributes as “job-priority” and “job-hold-until” are Job
487 attributes that affect the Job as a whole. On the other hand, such Job Template attributes as “media” and “number-
488 up” are Document attributes that the client is supplying as defaults for the Document objects. The Document objects
489 that are subsequently created for the specified Job are said to inherit the Document attributes from the Job object,
490 unless the Document Creation operation supplies a corresponding Document Template attribute. However, the
491 Printer MUST NOT copy down any Job Level attributes to the Document object as observable by a client in any Get-
492 Documents or Get-Documents-Attributes operation responses.

493 ~~A Printer that supports the Document object MUST support the Create-Job operation¹⁵ since the Create-Job
494 operation is the only operation that creates a Job object so that subsequent Document objects can be created in the
495 Job object.~~

496 3.1.3 Print-Job ([rfc2911] section 3.2.1)

497 This REQUIRED operation creates one Document object as a side effect of the Print-Job operation in addition to
498 creating the Job object. The Printer MUST copy all of the supported Operation attributes supplied by the client to the
499 corresponding Job Description or Document Description attributes as indicated in Table 8Table-8. For example, the
500 Printer copies the “job-name” and “attributes-charset” operation attributes to the corresponding Job Description
501 attributes, while copying the “document-format” and “document-charset” Operation attributes to the corresponding
502 Document Description attributes. The Printer MUST copy the supported Job Template attributes supplied by the
503 client to the Job object and MUST NOT copy them down to the Document object. In other words, the Document
504 object created by Print-Job has an empty group of Document (and Job) Template attributes. Any Job Template
505 attributes supplied that affect Documents have effect on the Document object because the Document object inherits
506 them from the Job object.

507 The Printer MUST populate the single Document object’s “document-state”, “document-state-reasons”, and
508 “document-number” Document Description attributes with appropriate values. Thus a Get-Job-Attributes operation
509 returns the same attributes for a Job created with Print-Job as a Printer that doesn’t support the Document object.
510 However, a Get-Documents or Get-Documents-Attributes for a Job created by Print-Job will return no Document
511 Templates attributes (since the client can’t submit any with Print-Job), but will return the populated Document
512 Description attributes, such as “document-format”, supplied by the client.

513 Note: Using the Get-Job-Attributes and Get-Documents-Attributes, a Job created by Print-Job will be indistinguishable
514 to a client from a Job created with Create-Job and Send-Document with no Document Template attributes supplied.
515 Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted
516 the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and
517 Send-Document (with no Document Template attributes supplied). However, if a new client supplies Document
518 Template attributes on the Send-Document, instead of the same attributes as Job Template attributes on the Create-
519 Job, then an old client will not see any of the Document Template attributes when it performs the Get-Job-Attributes
520 operation (since the Printer does not “copy up” Document Template attributes to the Job Level on a Get-Job-
521 Attributes on a one document job

¹³ In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

¹⁴ In the PWG Semantic Model, attributes are classified as Job Processing versus Document Processing in their definition. The client supplies them in separate Job Processing or Document Processing groups in the Job Creation operation. Such Document Processing attributes are defaults for subsequent Document Creation operations for that Job.

¹⁵ In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

522 3.1.4 Print-URI ([rfc2911] section 3.2.2)

523 This OPTIONAL operation creates one Document object as a side effect of the Print-URI operation [in creating the](#)
 524 [Document object with Document Description attributes](#). The Printer MUST copy all of the [supported](#) Operation
 525 attributes [supplied by the client](#) and the Job Template attributes as indicated for Print-Job in section 3.1.3. In addition
 526 the Printer MUST copy the “document-uri” Operation attribute to the corresponding Document Description attribute.

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

530 3.2 [Validate-Job \(\[rfc2911\] section 3.2.4\)](#)

531 [This REQUIRED operation is similar to the Print-Job operation \(\[rfc2911\] section 3.2.1 and \[this spec\] section 3.1.3\)](#)
 532 [except that a client supplies no document data and the Printer allocates no resources \(i.e., it creates neither a new](#)
 533 [Job object nor a Document object\). This operation is used only to verify capabilities of a Printer object against](#)
 534 [whatever attributes are supplied by the client in the Validate-Job request. By using the Validate-Job operation a](#)
 535 [client can validate that an identical Print-Job operation \(with the document data\) would be accepted. A client can](#)
 536 [also use the Validate-Job operation to validate that an identical Send-Document operation \(with the document data\)](#)
 537 [would be accepted. Such a client MAY either:](#)

538 [\(1\) perform all of the Validate-Job operations for each of the documents before doing the Create-Job in order](#)
 539 [to validate all documents before creating the Job and transmitting any document data OR](#)

540 [\(2\) perform a Create-Job and then a Validate-Job before each Send-Document \(or Send-URI\) operation.](#)

541 [There are certain configurations and implementations where the above validation will not completely validate a multi-](#)
 542 [document job with differing Document Template attributes for the same Job. Consider a Printer that is representing](#)
 543 [several dissimilar devices in which no device is a superset of the others. In such as case, the Printer MAY reject a](#)
 544 [Send-Document operation that cannot be supported in the Job because the combination of its supplied Document](#)
 545 [Template attributes cannot be supported in the same Job in combination with the differing Document Template](#)
 546 [attributes of the previously supplied documents. In such a case, there is no way to completely validate a multi-](#)
 547 [document job which has documents with differing Document Template attributes using Validate-Job, since each](#)
 548 [Validate-Job is a separate independent operation. An administrator can avoid such a configuration by making sure](#)
 549 [that one of the devices is a superset of all of the other devices.](#)

550 3.3 Get-Documents Operation

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

554 This operation is similar to the Get-Document-Attributes operation (see section 4.3), except that this Get-Documents
 555 operation returns attributes from all Document objects contained in the Job object, instead of from a single selected
 556 Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return
 557 attributes that were submitted by a client when the Document object was created by the [Create-Document](#), [Send-](#)
 558 [Document](#), or [Send-URI](#) operations and possibly modified by the [Set-Document-Attributes](#) operation (see section
 559 4.4).

560 3.3.1 Get-Documents Request

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

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

565 Group 1: Operation Attributes

566 Natural Language and Character Set:

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

568 Target:

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

571 Requesting User Name:

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

574 3.3.1.1 "limit" (integer(1:MAX)):

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

581 3.3.1.2 "requested-attributes" (1setOf type2 keyword):

582 The client OPTIONALLY supplies this attribute. The Printer MUST support this attribute. It is a set of
583 Document attribute names and/or attribute groups names in whose values the requester is interested. This
584 set of attributes is returned for each Document object that is returned. The allowed attribute group names
585 are the same as those defined in the Get-Documents-Attributes operation in section 4.3.1.

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

588 'document-number' (see section 9.1.21)
589

590 3.3.2 Get-Documents Response

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

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

596 **Group 1: Operation Attributes**597 **Status Message:**

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

601 **Natural Language and Character Set:**

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

603 **Group 2: Unsupported Attributes**

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

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

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

611 The Printer responds with one set of [Document Template attributes \(see the D column in Table 10Table 10\)](#)
 612 [and Document Description attributes \(see the Doc column in Table 11Table 11\)](#) [Document Object Attributes](#)
 613 for each returned Document object as specified by the "requested-attributes" Operation attribute supplied by
 614 the client in the request. The Printer ignores (does not respond with) any requested attribute or value which
 615 is not supported or which is restricted by the security policy in force, including whether the requesting user is
 616 the user that submitted the job (job originating user) or not (see [rfc2911] section 8). However, the Printer
 617 MUST respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for
 618 which the Printer does not know the value, unless it would violate the security policy. See the description of
 619 the "out-of-band" values in the beginning of [rfc2911] section 4.1.

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

622 **3.4 Cancel-Job ([rfc2911] section 3.3.3)**

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

626 **3.5 Close-Job([JobXjobx] section 3.1z.z.z)**

627 This **OPTIONAL** operation defined in [JobXjobx] closes the Job¹⁶. The Printer SHOULD support this operation. The
 628 client SHOULD issue this operation to close the job, instead of supplying the "last-document" Operation attribute (see
 629 section 4.1 **Error! Reference source not found.**) with a 'true' value in a Document Creation operation (or a Send-
 630 Document operation with no data - see [rfc2911] section 3.3.1). The Printer MUST support both means of closing
 631 jobs for backward compatibility with [rfc2911].

632 **ISSUE02: Should Close-Job be REQUIRED for the Document object spec?**

¹⁶ Close-Job is a operation defined by [JobX] and is not defined in [rfc2911].

633 **3.6 Send-Document** ([rfc2911] section 3.3.1)

634 This REQUIRED Job operation is a Document Creation operation that has been extended to accept a new Document
635 Attributes group (Group 4) that the client can supply Document Template attribute and creates a Document object
636 (see section 4.1 for the extension semantics).

637 **3.7 Send-URI** ([rfc2911] section 3.3.2)

638 This OPTIONAL Job operation is a Document Creation operation that has been extended to accept a new Document
639 Attributes group (Group 4) that the client can supply Document Template attribute and creates a Document object
640 (see section 4.2 for the extension semantics).

641 **3.8 Hold-Job** ([rfc2911] section 3.3.5)

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

645 **3.9 Release-Job** ([rfc2911] section 3.3.6)

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

649 **3.10 Restart-Job** ([rfc2911] section 3.3.7)

650 This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]
651 section 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section
652 4.5). Therefore, the Printer removes any 'canceled-by-xxx' values from any of the "document-state-reasons"
653 attributes and the Job's "job-state-reasons" attributes so that any canceled Documents are reprocessed along with
654 the other Documents.

655 **3.11 Reprocess-Job** ([adm-ops] section 4.1)

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

660 **4 Document Operations**

661 This section defines the Document Creation and Document operations. The Document object semantics are as
662 parallel to the Job object semantics as possible. Therefore, most of the Job operations have analogous Document
663 operations as shown in [Table 17](#) ~~Table 17~~ in section "Appendix A: Document operations compared to Job
664 operations". Operations that can apply only to an entire job, have no analogous document operation as indicated.
665 This extension adds [7-5](#) new Document operations that operate on the Document object once it is created by ~~the~~
666 [new Create-Document operation](#) or either of the existing two operations: Send-Document and Send-URI operations.

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

669 The signatures of the operation requests that create ~~and/or validate~~ Document objects are very similar as shown in
 670 ~~Table 4~~ ~~Table 4~~ and defined in section ~~Error! Reference source not found.~~ through section 4.2. The entries in the
 671 table show what a client MUST, MAY, or MUST NOT supply in the indicated operation requests.

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

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

673

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

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

	Create-Job	Send-Document	Send-URI
Status code/message	MUST	MUST	MUST
Unsupported Attributes	MUST, if any	MUST, if any	MUST, if any
Job status attributes	MUST	MUST	MUST
Document status attributes:			
"document-number"	MUST NOT	MUST	MUST
"document-state"	MUST NOT	MUST	MUST
"document-state-reasons"	MUST NOY	MUST	MUST
"document-state-message"	MUST NOT	MAY	MAY

677

678 **4.1 Send-Document ([\[rfc2911\] section 3.3.1](#)) extension**

679 This REQUIRED¹⁷ Document Creation operation allows a client to submit multiple documents in a single Job by
 680 making a Send-Document request for each Document. In this specification, the Send-Document creates a
 681 Document object ([rfc2911] did not have a Document object). A Printer MUST support this operation with the
 682 semantics specified in [rfc2911] and with the extension defined in this specification, since this specification
 683 REQUIRES the Printer to support multiple document jobs.

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

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

¹⁷ This specification REQUIRES the Printer to support the Send-Document operation while [rfc2911] did not. This difference is because this specification REQUIRES the Printer to support multiple document jobs, while [rfc2911] did not.

689 4.1.1 Send-Document Request

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

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

692 As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in [Table](#)
693 ~~8~~[Table 8](#). For example, "compression", "document-format", and "document-name". ~~So this group is the~~
694 ~~same as for Create-Document (see section~~ [Error! Reference source not found.](#)~~).~~

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

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

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

701 The client MUST supply the document data in-line to be processed for this Document if the "last-document"
702 flag is set to 'false' [or omitted](#). However, since a client might not know that the previous Document Creation
703 operation that the client had supplied (~~Create-Document/Send-Data pair,~~ a Send-Document, or a Send-URI
704 operation) was the last document (i.e., the client had supplied the "last-document" attribute with a 'false'
705 value), the client MUST use either (1) the Close-Job operation (see section 3.5) or (2) or (2) a Send-
706 Document request with no document data where the "last-document" flag is set to 'true' ([see \[rfc2911\]](#)
707 [section 3.3.1](#)). For this Send-Document case with no data, the Printer MUST NOT increment the value of the
708 Job object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it
709 is not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and
710 Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is
711 only an empty job which is scheduled and processed normally.

712 4.1.2 Send-Document Response

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

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

715 Status Message:

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

719 Natural Language and Character Set:

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

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

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

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

724 The Printer MUST return the same set of Job status attributes as for the Print-Job, ~~Send-Document, and~~
725 ~~Create-Document~~ response [as specified in \[rfc2911\] section 3.2.1.2s](#) (~~see section~~ [Error! Reference source](#)
726 [not found.](#)~~).~~

727 **Group 4: Document Object Attributes** (new ~~as in Create-Document Group 3~~ ~~see section~~ ~~Error!~~ ~~Reference~~
 728 ~~source not found.~~)

729 The ~~Printer MUST return the following Document Description~~ attributes are defined for this Group: ~~same set~~
 730 ~~of Document status attributes as for the Create-Document operation response (see section~~ ~~Error!~~
 731 ~~Reference source not found.)~~.

732 4.1.2.1 document-number (integer(1:MAX))

733 The Printer MUST return the document number of this Document object that was assigned by the Printer
 734 starting with 1 for each Job (see section 9.1.21).

735 4.1.2.2 document-state (type1 enum)

736 The Printer MUST return the state of this Document object (see section 9.1.23).

737 4.1.2.3 document-state-reasons (1setOf type2 keyword)

738 The Printer MUST return the associated state reasons for this Document (see section 9.1.25).

739 4.1.2.4 document-state-message (text(MAX))

740 The Printer MAY return the localized description of the "document-state" and "document-state-reasons"
 741 values for this Document (see section 9.1.24).

742 **4.2 Send-URI ([rfc2911] section 3.3.2) extension**

743 This OPTIONAL Document Creation operation has the same request and response semantics as the Send-
 744 Document operation (see section 4.1) except that a client MUST supply a URI reference ("document-uri" Operation
 745 attribute) rather than the document data itself. If a Printer supports this operation, clients can use ~~any either this~~
 746 ~~operation or the of (1) Send-URI, (2) Send-Document, and/or (3) Create-Document/Send-Data~~ operations to add
 747 new ~~d~~Document objects to an existing multi-document Job object. However, if a client needs to indicate that the
 748 previous Send-URI, ~~or~~ Send-Document, ~~or Create-Document/Send-Data~~ was the last document, the client MUST
 749 use either (1) the Close-Job operation (see section 3.5) or (2) the Send-Document operation (see section 4.1) with
 750 no document data and the "last-document" flag set to 'true' as specified in [rfc2911] section 3.3.2 (rather than using a
 751 Send-URI operation with no "document-uri" Operation attribute).

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

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

756 **4.3 Get-Document-Attributes**

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

761 The Printer MUST return the Document Description attributes that a client supplied in the Document Creation
 762 operation (Print-Job, Print-URI, ~~Create-Document~~, Send-Document, or Send-URI) as Operation attributes (see the
 763 PJ/PU and SD/SU columns in ~~Table 8~~ ~~Table 8~~ and the Doc column in ~~Table 11~~ ~~Table 14~~), any Document Template

764 [attribute supplied by Send-Document or Send-URI](#)-operations (see the D column in [Table 10Table 10](#)), plus any
765 [additional](#) Document Description attributes that the Printer has generated, such as "document-state" (see the Doc
766 [column in Table 11Table 11](#)). The Printer MUST NOT return any Job Level attributes that the Document object
767 inherits and MUST NOT factor out common Document object attributes and return them as Job object attributes.
768 Thus the Get-Document-Attributes returns to clients [only](#) the attributes that clients submitted [with the Job object and](#)
769 [with the Document object](#) in Document Creation operations, plus the additional Document Description attributes that
770 [the Printer sets](#).

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

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

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

781 - 'document-description': the subset of the Document Description attributes specified in the "Doc" column of
782 [Table 11Table 11](#) that the implementation supports for Document objects.

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

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

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

791 4.3.1 Get-Document-Attributes Request

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

794 Group 1: Operation Attributes

795 Natural Language and Character Set:

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

797 Target:

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

803 Requesting User Name:

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

806 4.3.1.1 "requested-attributes" (1setOf keyword):

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

810 4.3.2 Get-Document-Attributes Response

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

812 Group 1: Operation Attributes**813 Status Message:**

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

817 Natural Language and Character Set:

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

821 Group 2: Unsupported Attributes

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

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

828 Group 3: Document Object Attributes

829 ~~This is~~ The Printer returns the set of requested [Document Template attributes \(see the D column in Table](#)
830 [10Table-10\)](#) and [Document Description attributes \(see the Doc column in Table 11Table-11\)](#) ~~attributes~~ and
831 their current values. The Printer ignores (does not respond with) any requested attribute or value which is
832 not supported. Furthermore, the Printer MUST NOT return Document Template attributes that were not
833 supplied by a client in a [Create-Document](#), [Send-Document](#), or [Send-URI](#) request or set by a [Set-Document-](#)
834 [Attributes](#) request. So the response reflects what was submitted. The Printer MAY omit returning attributes
835 that are restricted by the Printer's security policy in force, including whether the requesting user is the user
836 that submitted the job (job originating user) or not (see [rfc2911] section 8). However, the Printer MUST
837 respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which
838 the Printer does not know the value, unless it would violate the security policy. See the description of the
839 "out-of-band" values in the beginning of [rfc2911] Section 4.1.

840 4.4 Set-Document-Attributes

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

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

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

855 If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2),
856 then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic
857 effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as
858 if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
859 applies its default attribute or behavior with lower precedence than the PDL (see the beginning of [rfc2911] section
860 4.2 and [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-
861 Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
862 However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
863 subsequent Set-Document-Attributes operation.

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

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

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

883 The Printer MUST accept or reject this operations when the Document's READ-ONLY "document-state" attribute has
884 the values shown in ~~Table 6~~Table 6. The document's current state MUST affect whether the Printer accepts or
885 rejects the request. However, the Set-Document-Attributes operation MUST NOT change the state of the Document

886 object (since the Document is a passive object and the Document state is a subset of the Job State). For example,
 887 in the case where the operation creates a request for unavailable resources, the Job (but not the Document)
 888 transitions to a new state. [Table 6](#) shows the allowed behaviors in each document state.

889 **Table 6 - 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'

890

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

894 **4.4.1 Settable and READ-ONLY Document Description attributes**

895 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:
 896 all Document Template document ("xxx") attributes
 897 that the implementation supports (see the column labeled "D" in [Table 10](#)).

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

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

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

908 **4.4.2 Set-Document-Attributes Request**

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

910 **Group 1: Operation Attributes**

911 **Natural Language and Character Set:**

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

913

Target:

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918

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

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

927

Requesting User Name:

928

929

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

930

Group 2: Document Attributes

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

940

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942

In order to set the Document's "document-message" Document Description attribute (see section 9.1.18), the client MUST supply the attribute in Group 2, rather than supplying a "document-message" Operation attribute in Group 1.

943

944

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

945

4.4.3 Set-Document-Attributes Response

946

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

947

Group 1: Operation Attributes

948

Status Message:

949

950

951

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.

952

Natural Language and Character Set:

953

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

954 Group 2: Unsupported Attributes

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

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

- 961 1. The number of attributes supplied by the client exceeds the maximum number that the Printer
 962 supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see
 963 [rfc2911] section 13.1.4.9).
- 964 2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band
 965 attribute value (see [rfc2911] section 3.1.7 and [rfc2910]) and the 'client-error-attributes-or-values-
 966 not-supported' (see [rfc2911] section 13.1.4.12).
- 967 3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation: return the
 968 attribute with the 'not-settable' out-of-band attribute value (see [rfc3380] section 8.1) and the
 969 'client-error-attributes-not-settable' status code (see [rfc3380] section 7.1).
- 970 4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.
 971 If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
 972 supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911]
 973 section 13.1.4.12).
- 974 5. The values of some of the supplied attributes conflict with one another and/or other Document
 975 attribute values not being set: if the conflicting attribute in the operation has a single value return
 976 the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute
 977 and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-
 978 conflicting-attributes' status code (see [rfc2911] section 13.1.4.15).

979 4.5 Cancel-Document

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

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

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

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

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

998
 999 Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document
 1000 states, the Printer MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
 1001 attribute and then transition the document to the 'canceled' state when the processing ceases (see [rfc2911] section
 1002 4.3.8).

1003 Rule 2: If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons"
 1004 attribute, then the Printer MUST reject a Cancel-Document operation.

1005 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation must either be the job
 1006 owner or an operator or administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST
 1007 reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized'
 1008 as appropriate.

1009 **4.5.1 Cancel-Document Request**

1010 The following groups of attributes are part of the Cancel-Document Request:

1011 **Group 1: Operation Attributes**

1012 **Natural Language and Character Set:**

1013 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.1.

1014 **Target:**

1015 The client MUST supply the "document-number" (integer(1:MAX)) Operation attribute immediately after
 1016 either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) Operation attribute(s)
 1017 which define the target Document object for this operation as described in section [rfc2911] 3.1.5. If the
 1018 client omits the "document-number" Operation attribute, the Printer MUST reject the request and return the
 1019 'client-error-bad-request' status code.

1020 **Requesting User Name:**

1021 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
 1022 [rfc2911] section 8.3.

1023 **4.5.1.1 document-message (text(MAX))**

Operation attribute

1024 The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also
 1025 support the corresponding "document-message" (text(MAX)) Document Description attribute (see section
 1026 9.1.18) and copy this value to the "document-message" Document Description attribute. The end user can
 1027 use this Document Description attribute as a message to the operator and the operator can use it as a

1028 message to the user. The Printer MAY print this message on a document start sheet for this document, if
1029 any.

1030 The Printer MUST ignore the new "job-message-from-operator" Operation attribute (see [adm-ops] section 6)
1031 for this operation, since that is a job only attribute and Cancel-Document is a Document operation.

1032 4.5.2 Cancel-Document Response

1033 The following sets of attributes are part of the Cancel-Document Response:

1034 Group 1: Operation Attributes

1035 Status Message:

1036 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
1037 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) Operation attribute as
1038 described in [rfc2911] sections 13 and 3.1.6.

1039 Natural Language and Character Set:

1040 The "attributes-charset" and "attributes-natural-language" attributes as described in [rfc2911] section 3.1.4.2.

1041 Group 2: Unsupported Attributes

1042 See [rfc2911] section 3.1.7 for details on returning Unsupported Attributes.

1043 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
1044 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document
1045 enters the 'canceled' document-state (see section 9.1.23), the "document-state-reasons" attribute (see section
1046 9.1.25) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the
1047 Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

1048 5 Administrative Job and Document operations

1049 This section summarizes the extensions to existing Administrative Job and Printer operations and defines new
1050 Document Administrative operations. [The following administrative operations: Promote-Job \(\[adm-ops\] section 4.4.1\), Release-Held-New-Jobs \(\[adm-ops\] section 3.3.2\), Resume-Job \(\[adm-ops\] section 4.3.2\), Schedule-Job-After \(\[adm-ops\] section 4.4.2\) do not affect the Document objects because they are defined to affect the Job object as a whole.](#)

1054 5.1 Purge-Jobs ([rfc2911] section 3.2.9)

1055 This OPTIONAL Administrative Printer operation removes all Job and all of their contained Document objects.

1056 5.2 Cancel-Current-Job ([adm-ops] section 4.2)

1057 This OPTIONAL Administrative Printer operation sets the "document-state" Document Description attribute to
1058 'canceled' and the "document-state-reasons" Document Description attribute to 'canceled-by-xxx' for any documents
1059 in the current Job that have not yet reached a terminal state ('completed', 'canceled', or 'aborted'), where "xxx" is
1060 'user' or 'operator'. See [adm-ops] section 4.2.

1061 Note: There is no Cancel-Current-Document operation defined, since it is too likely that the Printer would have
1062 moved onto the next document before the operation could issue the request.

1063 **5.3 Suspend-Current-Job** ([adm-ops] section 4.3.1)

1064 This OPTIONAL Administrative Printer operation suspends the current job and sets the Job's "job-state" Job
 1065 Description attribute to 'processing-stopped' and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user'
 1066 or 'operator'. The Documents' "document-state" and "document-state-reasons" Document Description attributes are
 1067 unaffected (but the Documents are not processed any further, since the Job is stopped).

1068 **5.4 Delete-Document**

1069 This OPTIONAL Administrative Document operation removes the specified Document object and its data
 1070 immediately from the specified Job. The Printer MUST reject the request if the Document is in any state, but
 1071 'pending' (there is no 'pending-held' state for Documents). The Printer does not reassign the "document-number"
 1072 Document Description attribute values of the remaining Document objects in the Job, so that the deleted Document
 1073 object leaves a gap in the document numbering space for the Job. The Printer MUST return a 'client-error-not-found'
 1074 status code, in a subsequent Get-Document-Attributes operation for this Document object specifying its former
 1075 "document-number". This operation is similar to the Purge-Jobs operation that immediately deletes all jobs from the
 1076 Printer. However, the Delete-Document operation only deletes a single Document from the specified Job.

1077 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation MUST be an operator or
 1078 administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and
 1079 return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate. This
 1080 operation requires operator/administrator privileges, otherwise a rogue client could submit, then delete, at will using
 1081 up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-Document which goes
 1082 through the normal accounting, if any.

1083 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
 1084 Cancel-Document operation (see section 4.5).

1085 **6 Job and Document Template Attribute Precedence during Job processing**

1086 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
 1087 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document
 1088 Object attributes (Operation/Document Description and Document Template), Document Override attributes, Job
 1089 Object attributes (Operation/Job Description and Job Template), PDL instructions, PDL Interpreter initialization files,
 1090 and Printer's defaults. Since each attribute can be specified for all of these levels, it is important to define which level
 1091 takes precedence when the same attribute occurs at different levels with differing values.

1092 The attribute precedence model has the following features:

- 1093 1) In principle, each defined attribute can occur at each of the precedence levels.
- 1094 2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1095 driver, submission client, protocol, and Printer:
 - 1096 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,
 1097 operator, Printer, and the output device hardware.
 - 1098 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
 1099 pending, job processing.
- 1100 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1101 driver, submission client, protocol, and Printer.

1102 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to
 1103 the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to
 1104 reflect the user's wishes.

1105 The following levels of Attribute Precedence are defined in order of decreasing priority:

1106 1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section
 1107 3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
 1108 to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =
 1109 'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
 1110 long edge.

1111 Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for
 1112 its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all
 1113 Printers independent of the "pdl-override-supported" value.

1114 2. **Document Level - page override programming** - The special "page-overrides" collection Document
 1115 Template attribute (see [pwg5100.4]) supplied at the Document Level, that is, in a ~~Create-Document,~~
 1116 ~~Send-Document,~~ or Send-URI operation, that contains the attributes that are to have the page override
 1117 status for the specified ranges of pages in the ~~Input-Document-or-the-Output-Document~~. Supplied by the
 1118 client when submitting a Document object, or set by the user or operator after the Document has been
 1119 accepted either using the Set-Document-Attributes operation, or by the operator using means local to the
 1120 Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

1121 3. **Job Level - page override programming** - The special "page-overrides" collection Job Template
 1122 attribute (see [pwg5100.4]) supplied at the Job Level, that is, in a Job Creation operation, that contains
 1123 the attributes that are to have the page override status for the specified ranges of pages in the ~~Input-~~
 1124 ~~Document-or-the-Output-Document~~. Supplied by the client when submitting a job either in the protocol,
 1125 or set by the user or operator after the job has been accepted either using the Set-Job-Attributes
 1126 operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-
 1127 documents" = '1:1'; "pages" = '1:1'; "media" = 'letterhead'}

1128 4. **Document Level - Document object attributes** - The Document attributes supplied at the Document
 1129 Level, that is, Operation/Document Description and Document Template attributes supplied in a ~~Create-~~
 1130 ~~Document,~~ Send-Document, or Send-URI operation to apply to the Input Document. Supplied by the
 1131 client when submitting a Document object, or set by the user or operator after the Document has been
 1132 accepted either using the Set-Job-Attributes operation, or by the operator using means local to the
 1133 Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1134 5. **Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job
 1135 Description and Job Template) and Document attributes (Operation/Document Description and
 1136 Document Template) supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation.
 1137 Supplied by the client when submitting a Job in the protocol, or set by the user or operator after the job
 1138 has been accepted either using the Set-Job-Attributes operation, or by the operator using means local to
 1139 the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1140 6. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print
 1141 driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether
 1142 PDL document data is actually lower precedence than the preceding levels depends on the
 1143 implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]
 1144 section 4.4.28 and [ippsave] section 8.1).

1145 Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
 1146 requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a
 1147

1148 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
 1149 attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
 1150 requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
 1151 and PCL MAY omit orientation, in which case, "orientation-requested" takes affect.

1152 7. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
 1153 each document in a Job. See description of "pdl-init-file" Job Template attribute in [ippsave] Section 5.8.
 1154 It is immaterial how this file is specified, whether it be by a queue override, job object attribute or printer
 1155 default – the precedence of the contents of this file is at this level.

1156 8. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
 1157 higher levels have supplied a value. The Printer implementation MUST supply values for all of the
 1158 Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,
 1159 if the output device will use media from the large-capacity input tray if not directed otherwise, the
 1160 implementation MUST supply the Printer's "media-default" attribute with the 'large-capacity' keyword
 1161 value without requiring the administrator to configure that value. The implementation MUST allow the
 1162 administrator to configure the Printer's "xxx-default" attributes to other values, if other value are
 1163 supported by the implementation. Example: The administrator changes the Printer's "media-default"
 1164 from 'large-capacity' to 'na-letter'.

1165 Note: Because of the requirement that the implementation supply pre-configured values for the
 1166 Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence
 1167 level.

1168 **7 Operation Attributes for the Job and Document Creation operations**

1169 This section defines some new Operation/Description attributes and lists *all* the Operation/Description attributes that
 1170 have been defined in other IPP specifications that are used in Job Creation operations and extends their use to the
 1171 Document Creation operations. In addition, some new Job/Document Description attributes have been defined to be
 1172 set from existing Operation attributes. Note: Operation attributes relate to the operation and do not depend on the
 1173 printing capabilities of the Printer.

1174 **7.1 Operation Attributes *supplied* at the Job and Document Levels for Creation**

1175 [Table 7](#) lists all the Operation attributes and their attributes syntaxes supplied in Job Creation and Document
 1176 Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer
 1177 Description attributes, if any. A "-" indicates that there isn't a "xxx-default" or "xxx-supported" Printer Description
 1178 attribute.

1179 **Table 7- Operation, Default, and Supported Attributes**

Operation attribute	Operation attribute syntax	Printer: Default Value attribute syntax	Printer: Supported Values attribute syntax
attributes-charset	charset	-	1setOf charset ¹⁸
attributes-natural-language	naturalLanguage	-	1setOf naturalLanguage
compression	type3 keyword	-	1setOf type3 keyword
document-charset	charset	charset	1setOf charset
document-digital-signature	type2 keyword	type2 keyword	1setOf type2 keyword
document-format	mimeMediaType	mimeMediaType	1setOf mimeMediaType

¹⁸ The Supported Printer attribute is named "charset-supported" (see [rfc2911] section 4.4.18), rather than "attributes-charset-supported".

Operation attribute	Operation attribute syntax	Printer: Default Value attribute syntax	Printer: Supported Values attribute syntax
document-format-details	1setOf collection	1setOf collection	1setOf type2 keyword ¹⁹
document-source-application-name	name(MAX)	name(MAX)	-
document-source-application-version	text(127)	text(127)	-
document-source-os-name	name(40)	name(40)	-
document-source-os-version	text(40)	text(40)	-
document-format	mimeMediaType	mimeMediaType	-
document-format-device-id	text(127)	text(127)	-
document-format-version	text(127)	text(127)	-
document-natural-language	naturalLanguage	naturalLanguage	-
document-format-version	text(127)	text(127)	1setOf text(127)
document-message	text(MAX)	-	-
document-name	name(MAX)	-	-
document-natural-language	naturalLanguage	naturalLanguage	1setOf naturalLanguage
document-uri	uri	-	1setOf uriScheme ²⁰
ipp-attribute-fidelity	boolean	-	-
[job-]impressions	integer(0:MAX)	-	rangeOfInteger(0:MAX)
[job-]k-octets	integer(0:MAX)	-	rangeOfInteger(0:MAX)
job-mandatory-attributes	1setOf type2 keyword	-	-
[job-]media-sheets	integer(0:MAX)	-	rangeOfInteger(0:MAX)
job-name	name(MAX)	-	-
job-password	octetString(255)	-	integer(0:127)
job-password-encryption	type3 keyword name(MAX)	-	1setOf (type3 keyword name(MAX))
last-document	boolean	-	-
operation-id	integer(1:0x8FFF)	-	1setOf type2 enum ²¹
original-requesting-user-name	name(MAX)	-	-
output-device-requested	name(127)	-	1setOf name(MAX)
page-overrides	1setOf collection ²²	-	1setOf type2 keyword
printer-uri	uri	-	1setOf uri
request-id	integer(1:MAX)	-	-
requesting-user-name	name(MAX)	-	-
version-number	X.Y	-	1setOf type2 keyword ²³

1180

1181 | **Table 8** lists the Operation attributes that clients supply at the Job Level and/or the Document Level and
 1182 | whether the Printer copies (indicated by “⇒”) the supplied value to corresponding Job Description and/or Document
 1183 | Description attributes.

1184 Legend:

1185 **[job-]** an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute name
 1186 | could also be used for the Document object as an Operation/Document Description attribute. When this

¹⁹ There is also a "document-format-details-implemented" (1setOf collection), see section **Error! Reference source not found.**

²⁰ The Supported Printer attribute is named "reference-uri-schemes-supported" (see [rfc2911] section 4.4.27), rather than "document-uri-supported".

²¹ The Supported Printer attribute is named "operations-supported" (see [rfc2911] section 4.4.15), rather than "operation-id-supported".

²² See "page-overrides" in **Table 10** for the list of its member attributes.

²³ The Supported Printer attribute is named "ipp-versions-supported" (see [rfc2911] section 4.4.14), rather than "version-number-supported".

1187 attribute is used as an Operation/Document Description attribute, the [job-] prefix is dropped. Note: For the
 1188 PWG Semantic Model, the “job-” prefix is dropped.
 1189 “Level Supplied” column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,
 1190 PU=Print-URI, and CJ=Create-Job) and at the Document Level (~~CD=Create-Document~~, SD=Send-
 1191 Document, and SU=Send-URI) .
 1192 “y” the Operation attribute is defined for the indicated operation, but does not have a corresponding Job
 1193 Description or Document Description attribute (no “⇒”).
 1194 “y⇒” the Operation attribute has a corresponding Job Description (y⇒J) or Document Description (y⇒D) attribute
 1195 to which the Printer MUST copy this Operation attribute. See ~~Table 11~~Table 14 for the corresponding Job
 1196 and Document Description attributes ~~and whether there are corresponding “xxx-default” and “xxx-supported”~~
 1197 Printer Description attribute defined.
 1198 “-” the Operation attribute is *not* defined for the indicated operation.
 1199 ** these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation
 1200 operations
 1201 “Conformance” column indicates the conformance requirements for what the client supplies in a request and the
 1202 Printer supports in a request.
 1203 “Reference and Section” column indicates where the Operation attribute is defined in other IPP specs and this spec.
 1204

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

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc	Client supply	Printer support	
		CJ	PJ, PU	CD , SD, SU			
attributes-charset **	charset	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	-	y⇒ <u>D</u>	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-charset	charset	-	y⇒ <u>D</u>	y⇒	MAY	CMUS T ²⁴	[jobx] §4.2.1
document-digital-signature	type2 keyword	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.2
document-format	mimeMediaType	-	y⇒ ²⁵ <u>D</u>	y⇒ ²⁷	MAY	MUST	[rfc2911] §3.2.1.1, [jobx] §4.2.3
document-format-details	1setOf collection	-	y⇒ <u>D</u>	y⇒	MAY	CMUS T ²⁶	[jobx] §4.2.4

²⁴ The Printer MUST support the “document-charset” Operation/Document Description attributes, if the Printer supports a charset-ambiguous document format (see section **Error! Reference source not found.**).

²⁵ The Printer MUST copy the “document-format” Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

²⁶ The Printer MUST support the “document-format-details” Operation/Document Description attributes if the Printer supports a *packaging* MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc	Client supply	Printer support	
		CJ	PJ, PU	CD, SD, SU			
document-source-application-name	name(MAX)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.1
document-source-application-version	text(127)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.2
document-source-os-name	name(40)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.3
document-source-os-version	text(40)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.4
document-format	mimeMediaType	-	y⇒ <u>D</u>	y⇒	MUST	MUST	[jobx] §4.2.4.5
document-format-device-id	text(127)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.6
document-format-version	text(127)	-	y⇒ <u>D</u>	y⇒	SHOULD	MUST	[jobx] §4.2.4.7
document-natural-language	naturalLanguage	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.4.8
document-format-version	text(127)	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[jobx] §4.2.6
document-format	mimeMediaType	-	y⇒ ²⁷	y⇒ ²⁵	MAY	MUST	[rfc2911] §3.2.1.1, [1] §
document-name	name(MAX)	-	y⇒ <u>D</u>	y⇒	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	-	y⇒ <u>D</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1, [this spec] §7.2.1
document-uri	uri	-	y	y⇒	CMUST ²⁸	MAY	[rfc2911] §3.2.2
ipp-attribute-fidelity	boolean	y⇒ ²⁹ JError! Bookmark not defined.	y⇒ ²⁹ <u>J</u>	-	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1.1
[job-]impressions	integer(0:MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
[job-]k-octets	integer(0:MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
job-mandatory-attributes	1setOf type2 keyword	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MUST	[this spec] §3.1.1.2
[job-]media-sheets	integer(0:MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	y⇒	MAY	MAY	[rfc2911] §3.2.1.1
job-name	name(MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MUST	[rfc2911] §4.3.5
job-password	octetString(255)	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MAY	[ippsave] §4.1
job-password-encryption	type3 keyword name(MAX)	y⇒ <u>J</u>	y⇒ <u>J</u>	-	MAY	MAY	[ippsave] §4.2
last-document	boolean	-	-	y⇒ ³⁰	MUST	MUST	[rfc2911] §3.3.1.1, [jobx] §???
operation-id **	integer(1:0x8FFF)	y	y	y	MUST	MUST	[rfc2911] §3.1.2

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

²⁸ 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.

²⁹ The Printer MUST copy the “ipp-attribute-fidelity” Operation attribute to the corresponding (new) Job Description attribute defined in this specification so that the Printer can remember its value for subsequent Document Creation operations.

³⁰ The Printer MUST copy the “last-document” Operation attribute to the corresponding (new) Document Description attribute defined in this specification so that the client can determine the last document when querying the Document objects.

Operation attribute name for Job and Document Creation <i>requests</i>	Attribute Syntax	Level Supplied			Conformance		Reference and Section
		Job		Doc	Client supply	Printer support	
		CJ	PJ, PU	CD, SD, SU			
original-requesting-user-name **	name(MAX)	y⇒J	y⇒J	-	MAY	MAY	[adm-ops] §11.7.2.2
output-device-requested	name(127)	y⇒J-	y⇒J	-	MAY	MAY	[jobx] §
page-overrides	1 setOf collection ³¹	-	-	y⇒ ³²	MAY	MAY	[pwg5100.4] §5.2, [OvrRide]§9.2.3
printer-uri **	uri	y⇒ ³⁴ J	y⇒ ³³ J	y	MUST	MUST	[rfc2911] §3.1.5
printer-uri **	uri	y⇒ ³⁴ J	y⇒ ³⁴ J	y	MUST	MUST	[rfc2911] §3.1.5
request-id **	integer(1:MAX)	y	y	y	MUST	MUST	[rfc2911] §3.1.2
requesting-user-name **	name(MAX)	y	y	y	SHOULD	MUST	[rfc2911] §3.2.1.1
version-number **	X.Y	y	y	y	MUST	MUST	[rfc2911] §3.1.8

1207 “y”, “y⇒”, and “***”. See Legend at the beginning of the Table.
1208

1209 **7.2 Operation/Document Description attributes**

1210 The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Document
1211 Creation operation and their corresponding Document Description attributes. The following statements apply to all of
1212 these Operation/Document Description attributes and are *not* repeated in each Description:

1213 If the Printer doesn’t support the “xxx” Operation attribute, the Printer MUST ignore the “xxx” attribute (as with any
1214 OPTIONAL Operation attribute) and return the “xxx” attribute with the supplied value as unsupported in the
1215 Unsupported attributes group as specified in [rfc2911] section 3.1.7.

1216 If the Printer supports the “xxx” Operation attribute, the Printer MUST support it at the Job and Document level. The
1217 Printer MUST also:

- 1218 1. support the corresponding “xxx” Document Description attribute of the same name (see section 9.1) and vice
1219 versa.
- 1220 2. copy the value of the “xxx” Operation attribute, if supplied by the client, to the corresponding “xxx” Document
1221 Description attribute.

³¹ See “page-overrides” in ~~Table 10~~Table 40 for the list of its member attributes.

³² The preferred method for a client to supply “page-overrides” is as a Document Template attribute (see section 8). However, the “page-overrides” attribute is also an Operation attribute that the client MAY supply in the Send-Document or Send-URI operation in [pwg5100.4] as an Operation attribute, since there was no place for supplying Job Template or Document Template attributes until this IPP Document Object specification. The Printer copies the “page-overrides” Operation attribute to the corresponding Job Template Document attribute. There is no “page-overrides” Job or Document Description attribute.

³³ The Printer MUST copy the “printer-uri” Operation attribute to the Job’s “job-printer-uri” Job Description attribute and Document’s “document-printer-uri” Document Description attribute. The Printer MUST copy the “printer-uri” Operation attribute to the Job’s “job-printer-uri” Job Description attribute and Document’s “document-printer-uri” Document Description attribute.

1222 3. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
1223 (see section 10) and vice versa.

1224 4. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
1225 Printer's corresponding "xxx-supported" Printer Description attribute (see section 10). If the values do not
1226 validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the
1227 attributes described below.

1228 If the client supplies one of the "xxx" Operation/Document attributes with a value that the Printer does not support,
1229 the Printer MUST perform one of the actions indicated for that Operation, unless specified otherwise, such as (1)
1230 reject the request, (2) accept the request and either (a) hold the job for operator intervention or (b) print the Job
1231 ignoring the attribute. In all of these cases, the Printer MUST return the Operation attribute with the unsupported
1232 value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

1233

1234 7.2.1 document-natural-language (naturalLanguage)

1235 This OPTIONAL Operation attribute specifies the natural language of the Document Object content (see [rfc2911]
1236 section 3.2.1.1 and section 4.1.8).

1237 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
1238 support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and
1239 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 7.2 above
1240 for more details.

1241 The values MAY include region as well as the language according to [rfc2911] section 4.1.8. If the document
1242 contains more than one language, the value is the first or primary language of the document. The Printer MAY use
1243 this value to select fonts or other Globalization processing. As indicated in [rfc2911] section 4.1.8, example include:

1244 'en': for English
1245 'en-us': for US English
1246 'fr': for French
1247 'de': for German
1248

1249 7.3 Override Operation attributes in Send-Document and Send-URI

1250 ACTION ITEM PZ: Rework to align with new override spec

1251 With the introduction of the Document Object, there is no longer a need for the "document-overrides" (1setOf
1252 collection) attribute [pwg5100.4] as an Operation attribute or a Document Template attribute. Also we are unaware
1253 of any implementations of the "document-overrides" attribute. Therefore, the intent is to republish the Overrides
1254 document [pwg5100.4] with only the "page-overrides" attribute. With the introduction of the Document object, the
1255 client simply supplies the Document Template attributes (see [Table 10](#)~~Table 10~~) for each Document Creation request
1256 (in a new Document Template attribute group) without needing a collection (and without needing the "document-
1257 overrides" attribute).

1258 The "document-overrides" attribute is also useful in combination with the "pages-per-subset" (1setOf integer) Job
1259 Template attribute (see [pwg5100.4]) which divides up the Input Page stream concatenated across the Input
1260 Documents into separate Output Documents. For example, making every 10 Input Pages be a separate Output
1261 Document but the client only wants to staple the first Output Document, so the client supplies a single "document-
1262 overrides" Job Template attribute with "finishings" that affects Output-Documents 1 only. With the removal of the
1263 "document-overrides" attribute, the client uses the "page-overrides" Job Template attribute to affect the stapling of
1264 pages 1:10 only.

1265 Similarly, according to [pwg5100.4], the “page-overrides” (collection) attribute MAY be supplied by the client in a
 1266 Send-Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent
 1267 documents in the job (by supplying either the “input-documents” (1setOf rangeOfInteger (1:MAX)) or the “output-
 1268 documents” (1setOf rangeOfInteger) member attribute). See the “page-overrides” Job Template attribute in [Table](#)
 1269 [10Table 10](#) for the listing of the member attributes. However, with the introduction of the Document object, the
 1270 “page-overrides” (collection) attribute MUST be supplied as a Document Template attribute ~~in the Create-Document~~
 1271 ~~operation and SHOULD be more simply supplied~~ as one of the Document Template attributes for the document
 1272 being created in the Send-Document or Send-URI operation and for this Document only. However, if a Printer
 1273 supports the “page-overrides” attribute as a Document Template attribute (in any Document Creation operations), a
 1274 Printer MUST also support the “page-overrides” attribute as an Operation attribute in the Send-Document and Send-
 1275 URI operations according to [pwg5100.4] for backward compatibility with clients that do not support the Document
 1276 object.

1277 **7.4 Operation Attributes returned in Job and Document Creation responses**

1278 [Table 9Table 9](#) lists the Operation attributes that Printers return in Job Creation operation responses: Print-Job, Print-
 1279 URI, and Create-Job and in Document Creation operation responses: Send-Document and Send-URI. The column
 1280 labeled “Conformance” indicates the conformance for what the Printer returns and what the Printer supports. The
 1281 Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1282 **Table 9 - Operation attributes returned in Job and Document Creation operation responses**

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
attributes-charset *	charset	MUST	MUST	[rfc2911] §3.1.4
	'utf-8'	MAY	MUST	[rfc2911] §4.1.7
	'us-ascii'	MAY	MAY	[rfc2911] §4.1.7
	'iso-8859-1'	MAY	MAY	[rfc2911] §4.1.7
	'iso-10646-ucs-2'	MAY	MAY	[rfc2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[rfc2911] §3.1.4
	'en-US'	MAY	MAY	[rfc2911] §4.1.8
detailed-status-message *	text	MAY	MAY	[rfc2911] §3.1.6.3
document-access-error	text	MAY	MAY	[rfc2911] §3.1.6.4
document-number	integer(1:MAX)	MUST	MUST	§9.1.21
job-id	integer(1:MAX)	MUST	MUST	[rfc2911] §4.3.2
job-uri	uri	MUST	MUST	[rfc2911] §4.3.1
redirect-uri (uri) ³⁵	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

1283 * - indicates attributes that are defined for all operations, not just Job Creation operations
 1284

³⁵ 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.

1285 **8 Job Template and Document Template attributes**

1286 | ~~Table 10~~Table 10 lists all of the Job Template attributes defined in other IPP specifications and lists their
 1287 corresponding Document Template attributes defined in this IPP specification. The Job Template attributes can be
 1288 supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1289 A subset of these Job Template attributes (e.g., “number-up” and “media”, but not “job-priority”) are also defined to
 1290 apply to Documents and are called Document Template attributes when supplied at the Document Level. Document
 1291 Template attributes can be supplied in the ~~Create-Document~~, Send-Document, and Send-URI operations.

1292 A subset of the Document Template attributes that apply to pages (e.g., “media”, but not “document-format” or “job-
 1293 priority”) can also be supplied as Page Overrides using the “page-overrides” Job Template collection attribute (see
 1294 [pwg5100.4]) or as a Document Template attribute.

1295 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
 1296 a Job Creation or Document Creation request or Page Overrides. If a Printer supports a Job Template or Document
 1297 Template attribute, then it MUST copy the supplied attribute to the Job or Document object, respectively so that a
 1298 client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-Document-Attributes/Get-
 1299 Documents operations, respectively. The effect of Job Template Attributes supplied in Job Creation requests are
 1300 inherited by the Document objects, unless the Document Creation operation supplies the attribute with a different
 1301 value.

1302 If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which
 1303 member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
 1304 Conformance column for each collection member attribute in ~~Table 10~~Table 10.

1305 The “Defined for use” column indicates whether the client MAY supply and the Printer support the attribute at the
 1306 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.

1307
 1308 “**” - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job
 1309 Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template
 1310 attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job
 1311 Processing attributes. These are indicated in the first column with “**”.

1312

Table 10 - Job Template and Document Template attributes

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
copies	integer(1:MAX)	y ³⁶	y	n	MAY	MAY	[rfc2911] §4.2.5
cover-back	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.1
cover-type	type2 keyword				MUST	MUST	[pwg5100.3] §3.1.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.1.1
media-col	collection					MAY	[pwg5100.3] §3.1.1
cover-front	collection	y	y	n	MAY	MAY	[pwg5100.3] §3.1
cover-type	type2 keyword				MUST	MUST	[pwg5100.3] §3.1.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.1.1
media-col	collection					MAY	[pwg5100.3] §3.1.1
feed-orientation	type3 keyword	y	y	n	MAY	MAY	[ippsave] §5.1
finishings	1setOf type2 enum	y ³⁷	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
finishings-col	collection	y ³⁷	y	y		MAY	[pwg5100.3] §3.2
finishing-template	name(MAX)				MAY	MAY	[pwg5100.3] §3.2.1
stitching	collection				MAY	MAY	[pwg5100.3] §3.2.2
stitching-reference-edge	type2 keyword				MUST	MUST	[pwg5100.3] §3.2.2.1
stitching-offset	integer (0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.2
stitching-locations	1setOf integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.2.2.3
font-name-requested	name(MAX)	y	y	y	MAY	MAY	[ippsave] §5.2
font-size-requested	integer (1:MAX)	y	y	y	MAY	MAY	[ippsave] §5.3
force-front-side	1setOf integer(1:MAX)	y ³⁸	y	y	MAY	MAY	[pwg5100.3] §3.3
imposition-template	type2 keyword name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.4

³⁶ 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.

³⁷ 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.

³⁸ 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.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
insert-sheet	1setOf collection	y ³⁸	y	y	MAY	MAY	[pwg5100.3] §3.5
insert-after-page-number	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.5.1
insert-count	integer(0:MAX)				MAY	MUST	[pwg5100.3] §3.5.2
media	type3 keyword name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.5.3
media-col	collection					MAY	[pwg5100.3] §3.5.3
job-account-id **	name(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.6
job-accounting-sheets	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
job-accounting-user-id**	name(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.7
job-copies	integer(1:MAX)	y	n ³⁹	n	MAY	MAY	[jobx] §5.1.1 Error! Reference source not found.

³⁹ 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	
job-cover-back	collection	y	n ⁴⁰	n	MAY	MAY	[jobx] §5.1.2Error! Reference source not found.
<i>same as cover-back</i>	<i>see cover-back</i>						
job-cover-front	collection	y	n ⁴¹	n	MAY	MAY	[jobx] §5.1.3Error! Reference source not found.
<i>same as cover-front</i>	<i>see cover-front</i>						
job-error-sheet	collection	y	n	n	MAY	MAY	[pwg5100.3] §3.9
job-error-sheet-type	type3 keyword name(MAX)				MUST	MUST	[pwg5100.3] §3.9.1
job-error-sheet-when	type2 keyword				MAY	MAY	[pwg5100.3] §3.9.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[pwg5100.3] §3.9.3
media-col	collection					MAY	[pwg5100.3] §3.9.3
job-finishings	1setOf type2 enum	y	n ⁴²	n	MAY	MAY	[jobx] §5.1.4Error! Reference source not found.
job-finishings-col	collection	y	n ⁴³	n	MAY	MAY	[jobx] §5.1.5Error! Reference source not found.
<i>same as finishings-col</i>	<i>see finishings-col</i>						
job-hold-until	type3 keyword name(MAX)	y	n	n	MAY	MAY	[rfc2911] §4.2.2
job-hold-until-time	dateTime	y	n	n	MAY	MAY	[ippsave] §5.4
job-message-to-operator	text(MAX)	y	n ⁴⁴	n	MAY	MAY	[pwg5100.3] §3.10
job-phone-number	text(127)	y	n	n	MAY	MAY	[ippsave] §5.5
job-priority	integer(1:100)	y	n	n	MAY	MAY	[rfc2911] §4.2.1
job-recipient-name **	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.6

⁴⁰ 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’.

⁴¹ 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’.

⁴² 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’.

⁴³ 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’.

⁴⁴ 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	
job-save-disposition	collection	y	n	n	MAY	MAY	[ippsave] §5.7
save-disposition	type3 keyword	y	n	n	MAY	MAY	[ippsave] §5.7.1.1
save-info	1setOf collection	y	n	n	MAY	MAY	[ippsave] §5.7.1.2
save-location	uri	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.1
save-name	name(MAX)	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.2
save-document-format	mimeMediaType	y	n	n	MAY	MAY	[ippsave] §5.7.1.2.3.3
job-sheet-message	text(MAX)	y	n	n	MAY	MAY	[pwg5100.3] §3.12

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-sheets	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
job-sheets-col	collection	y	n	n		MAY	[pwg5100.3] §3.11
job-sheets	type3 keyword name(MAX)				MUST	MUST	[pwg5100.3] §3.11.1
media	type3 keyword name(MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.3] §3.11.2
media-col	collection					MAY	[pwg5100.3] §3.11.2
media	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
media-col	collection	y	y	y		MAY	[pwg5100.3] §3.13
media-back-coating	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
media-color	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.4
media-front-coating	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.10
media-grain	type3 keyword name(MAX)				MAY	MAY	[ippsave] §8.4.2
media-hole-count	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.6
media-info	text(255)				MAY	MAY	[pwg5100.3] §3.13.3
media-key	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.1
media-material	type3 keyword name(MAX)				MAY	MAY	[ippsave] §8.4.3
media-order-count	integer(1:MAX)				MAY	MAY	[pwg5100.3] §3.13.7
media-preprinted	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.5
media-recycled	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.11
media-size	collection				MAY	MUST	[pwg5100.3] §3.13.8
x-dimension	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.1
y-dimension	integer(0:MAX)				MUST	MUST	[pwg5100.3] §3.13.8.2
media-thickness	integer(1:MAX)				MAY	MAY	[ippsave] §8.4.4
media-tooth	type3 keyword name(MAX)				MAY	MAY	[ippsave] §8.4.1
media-type	type3 keyword name(MAX)				MAY	MAY	[pwg5100.3] §3.13.2
media-weight-metric	integer(0:MAX)				MAY	MAY	[pwg5100.3] §3.13.9
media-input-tray-check	type3 keyword name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.14
media-type ⁴⁵	type3 keyword name(MAX)	y	y	y	MAY	MAY	[upnp], [pwg5100.3] §3.13.2
multiple-document-handling	type2 keyword	y	n	n	MAY	MUST ⁴⁶	[rfc2911] §4.2.4
number-up	integer(1:MAX)	y	y	y	MAY	MAY	[rfc2911] §4.2.9
orientation-requested	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.10

⁴⁵ UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

⁴⁶ A Printer MUST support the "multiple-document-handling" Job Template attribute with at least one value.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
output-bin	type2 keyword name(MAX)	y	n	n	MAY	MAY	[pwg5100.2] §2.1
page-delivery	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.15
page-order-received**	type2 keyword	y	y	n	MAY	MAY	[pwg5100.3] §3.16
page-overrides	1setOf collection	y ⁴⁷	y	n	MAY	MAY	[pwg5100.4] §5.2
input-documents	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[pwg5100.4] §5.2.1
output-documents	1setOf rangeOfInteger(1:MAX)					MUST	[pwg5100.4] §5.2.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[pwg5100.4] §5.2.3
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[pwg5100.4] §5.2.4
<i>any other Job Template attributes that affect pages, such as "media" or "media-col"</i>					MAY	MAY	
page-ranges	1setOf rangeOfInteger(1:MAX)	y	y	n	MAY	MAY	[rfc2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	y ⁴⁸	n	n	MAY	MAY	[pwg5100.3] §5.3
pdl-init-file	1setOf collection	y	y	n	MAY	MAY	[ippsave] §5.8
pdl-init-file-location	uri				MAY	MAY	[ippsave] §5.8.1.1
pdl-init-file-name	name(MAX)				MAY	MAY	[ippsave] §5.8.1.2
pdl-init-file-entry	name(MAX)				MAY	MAY	[ippsave] §5.8.1.3
presentation-direction-number-up	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.17
print-quality	type2 enum	y	y	y	MAY	MAY	[rfc2911] §4.2.13
printer-resolution	resolution	y	y	y	MAY	MAY	[rfc2911] §4.2.12
proof-print	collection	y	n	n	MAY	MAY	[ippsave] §5.9
proof-print-copies	integer (0:MAX)	y	n	n	MAY	MAY	[ippsave] §5.9.1.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[ippsave] §5.8.1.2
media-col	collection					MAY	[ippsave] §5.8.1.2
separator-sheets	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
sheet-collate	type2 keyword	y	y	n	MAY	MAY	[rfc3381] §3.1
sides	type2 keyword	y	y	y	MAY	MAY	[rfc2911] §4.2.8

⁴⁷ 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.

⁴⁸ The client MUST supply the "pages-per-subset" Job Template attribute at the Job Level and can only be used when the "multiple-document-handling" Job Template attribute is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies', since the purpose of the "pages-per-subset" attribute is to produce separate output documents for each subset. Otherwise, the Printer MUST ignore the "pages-per-subset" attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
x-image-position	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.2
x-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.3
x-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.4
x-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.5
y-image-position	type2 keyword	y	y	y	MAY	MAY	[pwg5100.3] §3.19.6
y-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.7
y-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.8
y-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.19.9

1313 **** - These 4 attributes are Job Description attributes, not Job Processing attributes, in the PWG Semantic Model
 1314 [pwg-sm] - see Legend before the Table.
 1315

1316 **8.1 Document Template attributes**

1317 Most Job Template attributes can be used as Document Template attributes for use in Document Creation
 1318 operations to apply to the Document object. However, the Job Template attributes that have the "job-" prefix MUST
 1319 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. [Table 10](#)~~Table~~
 1320 ~~40~~ shows lists all of the Document Template attributes for use with the Document Creation operations and the
 1321 Document object. All of the definitions of the Document Template attributes are done by reference to the
 1322 corresponding Job Template attributes in other specifications. However, the semantics of each Document Template
 1323 attribute only applies to the Document object with which the attribute is associated either by being supplied by the
 1324 client in the Document Creation operation or supplied by the Printer as a default because the client did not (and the
 1325 PDL did not have any corresponding instruction). See section 6 for defaulting semantics.

1326 The Document Template attribute share the same "xxx-default", "xxx-supported", and "xxx-ready" Printer attributes
 1327 with the Job Template attributes of the same name.

1328 The Document object also has the corresponding "xxx-actual" READ-ONLY Document Description attributes defined
 1329 that correspond to the "xxx" Document Template attributes (see [ippact]).

1330 **9 Job Description and Document Description attributes**

1331 [Table 11](#)~~Table 44~~ lists all the Job Description defined in other IPP specifications and the corresponding Document
 1332 Description attributes defined in this IPP specification. Job Description and Document Description attributes are Job
 1333 object and Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description
 1334 attribute values are supplied by the client in the Job/Document Creation operation using corresponding Operation
 1335 attributes as flagged with "". Unless specified otherwise herein, the Printer MUST NOT support modification of Job
 1336 Description and Document Descriptions attributes.

1337 The column labeled “attribute syntax” indicates the attribute syntax (see [rfc2911] section 4.1). The Printer
 1338 conformance is indicated along with the reference to the specification in which the attribute is defined. The
 1339 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
 1340 corresponding Job Description attributes.

1341 Each of the Document Description attributes have a sub-section in section 9.1. The column labeled References
 1342 column contains references to the sub-section in this document if there is significant information there. Those
 1343 subsections that are only references to other specifications contain only that reference in the Reference column.
 1344 Those attributes that are only Job Description attributes with no subsection in this specification have a “n/a” in the
 1345 “Doc Desc” column.

1346 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
 1347 object with a state and it cannot be queried.

1348 Legend:

1349 **[job-]** indicates an attribute that shouldn't have had a “job-” prefix in its name in [rfc2911], so that the same attribute
 1350 name could also be used for the Document object as a Document Description attribute. Note: For the PWG
 1351 Semantic Model, the “job-” prefix is dropped.

1352 “.” indicates that the Job or Document attribute is *not* defined.

1353 “⇒y” the Printer MUST populate this Job or Document Description attribute by copying *from* the corresponding
 1354 Operation attribute that the client MAY supply⁴⁹ in a Job or Document Creation operation. See [Table 8](#) ~~Table~~
 1355 **8** for the corresponding Operation attribute.

1356 (r/w) indicates that the Job Description or Document Description attribute is read/write, so that the client can
 1357 changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 4.4).

1358

Table 11 - Job and Document Description attributes

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
attributes-charset	charset	-	⇒y	MUST	[rfc2911] §4.3.19	§9.1.1
attributes-natural-language	naturalLanguage	-	⇒y	MUST	[rfc2911] §4.3.20	§9.1.2
compression	type3 keyword	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.1.3
current-page-order	type2 keyword	y	y	MAY	[pwg5100.3] §4.1	§9.1.4
date-time-at-completed	dateTime	y	y	MAY	[rfc2911] §4.3.14.7	§9.1.5
date-time-at-creation	dateTime	y	y	MAY	[rfc2911] §4.3.14.5	§9.1.6
date-time-at-processing	dateTime	y	y	MAY	[rfc2911] §4.3.14.6	§9.1.7
document-charset	charset	-	⇒y	CMUST ⁵⁰	-	§9.1.8
document-digital-signature	type2 keyword	-	⇒y	MAY	-	§9.1.9
document-format	mimeMediaType	-	⇒y	MUST	[rfc2911] §3.2.1.1	§9.1.8
document-format-details	1setOf collection	-	⇒y	CMUST ⁵¹	-	§9.1.11

⁴⁹ 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.

⁵⁰ The Printer MUST support the “document-charset” Operation/Document Description attributes if the Printer supports any charset-ambiguous document formats (see section **Error! Reference source not found.**).

⁵¹ The Printer MUST support the “document-format-details” Operation/Document Description attributes if the Printer supports a packaging MIME type document format, such as ‘application/zip’ or ‘multipart/related’.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference	
					Job Description Attr	Doc Desc.
document-source-application-name	name(MAX)	-	⇒y	MAY	-	§Error! Reference source not found.
document-source-application-version	text(127)	-	⇒y	MAY	-	§Error! Reference source not found.
document-source-os-name	name(40)	-	⇒y	MAY	-	§Error! Reference source not found.
document-source-os-version	text(40)	-	⇒y	MAY	-	§Error! Reference source not found.
document-format	mimeMediaType	-	⇒y	MUST	-	§Error! Reference source not found.
document-format-device-id	text(127)	-	⇒y	MUST	-	§Error! Reference source not found.
document-format-version	text(127)	-	⇒y	MAY	-	§Error! Reference source not found.
document-natural-language	naturalLanguage	-	⇒y	MAY	-	§Error! Reference source not found.
document-format-details-detected	1setOf collection	-	y	MAY	-	§9.1.12
document-format-detected	mimeMediaType	-	y	MAY	-	§9.1.13
document-format-version	text(127)	-	⇒y	MAY	-	§9.1.14
document-format-version-detected	text(127)	-	y	MAY	-	§9.1.15
document-job-id	integer(1:MAX)	-	y	MUST	-	§9.1.11
document-job-uri	uri	-	y	MUST	-	§9.1.17
document-number	integer(0:MAX)	-	y	MUST	-	§9.1.21
document-printer-uri	uri	-	y	MUST	-	§9.1.22
document-state	type1 enum	-	y	MUST	-	§9.1.23
document-state-message	text(MAX)	-	y	MAY	-	§9.1.24
document-state-reasons	1setOf type2 keyword	-	y	MUST	-	§9.1.25
document-uri	uri	-	⇒y	MAY	-	§9.1.26
impressions-completed-current-copy	integer(0:MAX)	y	y	MAY	[rfc3381] §4.4	§9.1.27

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference	
					Job Description Attr	Doc Desc.
ipp-attribute-fidelity	boolean	⇒y	-	MUST	[rfc2911] §3.2.1.1 [jobx] §6.1 Error! Reference source not found.	-
job-collation-type	type2 enum	y	-	MAY	[rfc3381] §4.1	-
[job-]detailed-status-message	1setOf text (MAX)	y	y	MAY	[rfc2911] §4.3.10	§9.1.28
[job-]document-access-errors	1setOf text(MAX)	y	y	MAY	[rfc2911] §4.3.11	§9.1.29
job-id	integer (1:MAX)	y	-	MUST	[rfc2911] §4.3.2	-
[job-]impressions	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.2	§9.1.31
[job-]impressions-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.2	§9.1.32
[job-]k-octets	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.1	§9.1.33
[job-]k-octets-processed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.1	§9.1.34
job-mandatory-attributes	1setOf type2 keyword	⇒y	-	MUST	[jobx] §6.3 Error! Reference source not found.	-
[job-]media-sheets	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.3	§9.1.35
[job-]media-sheets-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.3	§9.1.36
job-message-from-operator	text(127)	y	- ⁵²	MAY	[rfc2911] §4.3.16	-
[job-]more-info	uri	y	y	MAY	[rfc2911] §4.3.4	§9.1.37
job-name(r/w)	name(MAX)	⇒y	- ⁵³	MUST	[rfc2911] §4.3.5	-
job-originating-user-name	name (MAX)	y	-	MUST	[rfc2911] §4.3.6	-
job-password	octetString(255)	⇒y	-	MAY	[ippsave] §6.2	-
job-password-encryption	type3 keyword name(MAX)	⇒y	-	MAY	[ippsave] §6.3	-
job-printer-make-and-model	text(127)	y	-	CMUST ⁵⁴	[ippsave] §6.1	-
[job-]printer-up-time	integer (1:MAX)	y	y	MUST	[rfc2911] §4.3.14.4	§9.1.38
job-printer-uri	uri	⇒ ⁵⁵ y	-	MUST	[rfc2911] §4.3.3	-
job-state	type1 enum	y	- ⁵⁶	MUST	[rfc2911] §4.3.7	-
job-state-message	text(MAX)	y	- ⁵⁷	MAY	[rfc2911] §4.3.9	-
job-state-reasons	1setOf type2 keyword	y	- ⁵⁸	MUST	[rfc2911] §4.3.8	-
job-uri	uri	y	-	MUST	[rfc2911] §4.3.1	-

⁵² The “job-message-from-operator” Job Description attribute has no corresponding “document-message-from-operator” (text(127)) Document Description attribute. Instead, both the user and the operator use the “document-message” (text(127)) operation/Document Description attribute (see section 9.1.189.4.11) to communicate with each other.

⁵³ The Document Description attribute that corresponds to the “job-name” Job Description attribute is the (existing) “document-name” attribute defined in [rfc2911].

⁵⁴ The Printer MUST support the “job-printer-make-and-model” Job Description attribute if the “job-save-disposition” Job Template attribute is supported.

⁵⁵ The Printer sets the “job-printer-uri” Job Description attribute from the “printer-uri” Operation attribute.

⁵⁶ The Document Description attribute that corresponds to the “job-state” Job Description attribute is the (new) “document-state” attribute.

⁵⁷ The Document Description attribute that corresponds to the “job-state-message” Job Description attribute is the (new) “document-state-message” attribute.

⁵⁸ The Document Description attribute that corresponds to the “job-state-reasons” Job Description attribute is the (new) “document-state-reasons” attribute.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference	
					Job Description Attr	Doc Desc.
[job-]warnings-count	integer(0:MAX)	y	y	MAY	[pwg5100.4] §6.1	§9.1.39
last-document	boolean	-	⇒y	MAY	[rfc2911] §4.3.12	§9.1.39
number-of-documents	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.15	-
number-of-intervening-jobs	integer(0:MAX)	y	-	MAY	[rfc2911] §4.3.13	-
output-device-requested	name(127)	y	-	MAY	[this specjobx] §6.5 Error! Reference source not found.	-
output-device-assigned	name(127)	y	y	MAY	[rfc2911] §4.3.7.2	§9.1.41
sheet-completed-copy-number	integer(0:MAX)	y	y	MAY	[rfc3381] §4.2	§9.1.42
sheet-completed-document-number	integer(0:MAX)	y	-	MAY	[rfc3381] §4.3	-
time-at-completed	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.3	§9.1.43
time-at-creation	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.1	§9.1.44
time-at-processing	integer (MIN:MAX)	y	y	MUST	[rfc2911] §4.3.14.2	§9.1.45

1359 "y", "⇒y", "-" See the description in the Legend before the table.

1360

1361 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
 1362 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
 1363 Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing,
 1364 formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
 1365 most can apply to other types of service as well. The reason for separating state from reasons, is so that the states
 1366 can be the fundamental states that most implementations have, while the state reasons can vary depending on the
 1367 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
 1368 reasons are more information, both for programs and people.

1369 The descriptions of the new "document-state" and "document-state-reasons" attributes are merged in with the
 1370 existing "job-state" and "job-state-reasons". Such merging shows the parallelism in the description to aid
 1371 understanding and implementation and so that future maintenance will continue this strong parallelism. The "/"
 1372 character separates the words: Job from Document so that the same description can serve for both Job and
 1373 Document objects.

1374 **9.1 Document Description attributes**

1375 This section contains *all* of the Document Description attributes for use with the Document object. Most of these
 1376 definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
 1377 semantics of each Document Description attribute only applies to the Document object containing the Document
 1378 Description attribute. The Printer MAY support changing these Document Description attributes with the Set-
 1379 Document-Attributes operation (see section 4.4), but only if indicated explicitly in this section.

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!

1380 **9.1.1 attributes-charset (charset)**

1381 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
 1382 attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute

1383 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1384 4.1). ~~Error! Reference source not found.~~.

1385 **9.1.2 attributes-natural-language (naturalLanguage)**

1386 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1387 attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description attribute
1388 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1389 4.1 ~~Error! Reference source not found.~~).

1390 **9.1.3 compression (type3 keyword)**

1391 This REQUIRED Document Description attribute specifies the compression used to represent this document (see
1392 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute
1393 supplied by the client in the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

1394 **9.1.4 current-page-order (type2 keyword)**

1395 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1396 attribute (see [pwg5100.3] §4.1) applied to the Document object.

1397 **9.1.5 date-time-at-completed (dateTime)**

1398 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1399 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

1400 **9.1.6 date-time-at-creation (dateTime)**

1401 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1402 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

1403 **9.1.7 date-time-at-processing (dateTime)**

1404 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1405 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

1406 **9.1.8 document-charset (charset)**

1407 This OPTIONAL Document Description attribute specifies the charset used to represent this document (see [JobX]
1408 §4.2.1). The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by
1409 the client in the Document Creation operation (see section 4.1).

1410 **9.1.9 document-digital-signature (type2 keyword)**

1411 This OPTIONAL Description attribute specifies the digital signature technology used in the Document content. The
1412 Printer sets this Document Description attribute from the corresponding “document-digital-signature” Operation
1413 attribute ([JobX] §4.2.2 for the semantics), if supplied by the client in the Document Creation operation (see section
1414 4.1). If a Printer supports the “document-digital-signature” Operation attribute, the Printer MUST support this
1415 “document-digital-signature” Document Description attribute.

1416 **9.1.10 document-format (mimeMediaType)**

1417 This REQUIRED⁵⁹ Document Description attribute specified the document format of the Document Object content.
1418 The Printer sets this Document Description attribute from the corresponding “document-format” Operation attribute
1419 (see section [\[JobX\] §4.2.3](#)~~Error! Reference source not found.~~ for the semantics), if supplied by the client in the
1420 Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

1421 **9.1.11 document-format-details (1setOf collection)**

1422 This OPTIONAL Description attribute specifies the details of the document format(s) of the Document Object content.
1423 The Printer sets this Document Description attribute from the corresponding “document-format-details” Operation
1424 attribute ([JobX] §4.2.4 for the semantics), if supplied by the client in the Document Creation operation (see section
1425 4.1). . If a Printer supports the “document-format-details” Operation attribute, the Printer MUST support this
1426 “document-format-details” Document Description attribute.

1427 **9.1.12 document-format-details-detected (1setOf collection)**

1428 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format details of the
1429 Document object as detected by the Printer. The member attributes are the same as the “document-format-details”
1430 Operation attribute. (see [JobX] §6.6.4 for details)

1431 **9.1.13 document-format-detected (mimeMediaType)**

1432 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format of the
1433 Document object content as detected by the Printer. See [JobX] §6.6.5 for detailed semantics.

1434 **9.1.14 document-format-version (text(127))**

1435 This OPTIONAL Description attribute specifies the version of the document format of the Document Object content.
1436 The Printer sets this Document Description attribute from the corresponding “document-format-version” Operation
1437 attribute ([JobX] §4.2.6 for the semantics), if supplied by the client in the Document Creation operation (see section
1438 4.1). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this
1439 “document-format-version” Document Description attribute.

1440 **9.1.15 document-format-version-detected (text(127))**

1441 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format version of
1442 the Document content as detected by the Printer. See [JobX] §6.6.7 for detailed semantics..

1443 **9.1.16 document-job-id (integer(1:MAX))**

1444 This REQUIRED Document Description attribute is a *copy* of the Job’s “job-id” Job Description attribute (see
1445 [rfc2911] §4.3.2), i.e., the “job-id” of the Job containing this Document.

1446 **9.1.17 document-job-uri (uri)**

1447 This REQUIRED Document Description attribute is a *copy* of the Job’s “job-uri” Job Description attribute (see
1448 [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:
1449 `ipp://www.company.com/printers/myprinter/jobs/22`

⁵⁹ [rfc2911] did not define a “document-format” Document Description attribute; it is a new attribute defined in this specification.

1450 9.1.18 document-message (text(MAX))

1451 This OPTIONAL Document Description contains a message from either (1) the user to the operator about the
 1452 Document or (2) from the operator, system administrator, or "intelligent" process to indicate to the end user the
 1453 reasons for modification or other management action taken on the Document. The Printer populates this Document
 1454 Description attribute from the "document-message" (text(MAX) Operation attribute value supplied by the client in any
 1455 of the Document Creation operations (see section 4.1 ~~Error! Reference source not found.~~) or in a Cancel-
 1456 Document operation (see section 4.5).

1457 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-
 1458 Document-Attributes operation (see section 4.4).

1459 9.1.19 document-name (name(MAX))

1460 This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1). The
 1461 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in
 1462 the Document Creation operation (see section 4.1 ~~Error! Reference source not found.~~).

1463 This attribute may be modified by a client using the Set-Documents-Attributes operation (see section 4.4).

1464 9.1.20 document-natural-language (naturalLanguage)

1465 This OPTIONAL Document Description attribute specifies the natural language of the Document Object content. The
 1466 Printer sets this Document Description attribute from the corresponding "document-natural-language" Operation
 1467 attribute (section 7.2.1 for the semantics), if supplied by the client in the Document Creation operation (see section
 1468 4.1 ~~Error! Reference source not found.~~). If a Printer supports the "document-natural-language" Operation attribute,
 1469 the Printer MUST support this "document-natural-language" Document Description attribute.

1470 9.1.21 document-number (integer(1:MAX))

1471 This REQUIRED Document Description attribute is the ordinal number of the document within the job which
 1472 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically
 1473 increasing from 1 for each job.

1474 9.1.22 document-printer-uri (uri)

1475 This REQUIRED Document Description attribute is a copy of the "printer-uri" Operation attribute (see [rfc2911]
 1476 §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document. Example:
 1477 `ipp://www.company.com/printers/myprinter.`

1478 9.1.23 document-state (type1 enum) and job-state (type1 enum)

1479 The ~~REQUIRED "job-state" and the~~ REQUIRED "document-state" Document Description attributes identify the
 1480 current state of the ~~job and document, respectively~~. Even though IPP defines ~~seven five~~ values for ~~job/document~~
 1481 states (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1), implementations only need to support those
 1482 states which are appropriate for the particular implementation. In other words, an IPP Printer implementation
 1483 supports only those ~~job/document~~ states implemented by the output device and available to the IPP Printer
 1484 implementation.

1485 ~~Table 12~~ Table 12 lists the ~~"job-state" and~~ "document-state" attribute values.

1486

Table 12 - ~~"job-state" and "document-state"~~ attribute values

<u>"document-state"</u> Values
3 pending
5 processing
7 canceled
8 aborted
9 completed

1487

1488 ~~The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state"~~
 1489 ~~attributes or just the "job-state" attribute as indicated in Table 12.~~ Standard enum values are:

Value	Symbolic Name and Description
'3'	'pending' (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'	'pending-held' (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'	'processing' (JD): One or more of: <ol style="list-style-type: none"> 1. The job is-has begun using, or is attempting to use, one or more purely software processes that are analyzing, creating, or interpreting a PDL, etc. for the Document, 2. The job is-has begun 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. for the Document, 3. The Printer has made the job Document is ready for printing, but the output device is not yet printing it, either because the job-Documents hasn't reached the output device or because the job-Documents is queued in the output device or some other spooler, awaiting the output device to print it. <p>When the job is in the 'processing' state, the entire job/document state includes the detailed status represented in the Printer's "printer-state", "printer-state-reasons", and "printer-state-message" attributes.</p> <p>On the other hand, theThe 'processing' state for the Document indicates that the Document has begun to be processed. Even if the Jjob stops being processed, the Document remains in the 'processing' state until it moves to one of the three terminal states.</p> <p>Implementations MAY include additional values in the job's/document's "job-state-reasons"/"document-state-reasons" attribute to indicate the progress of the job/document, such as adding the 'job-printing'/'printing' value to indicate when the output device is actually making marks on paper and/or the 'processing-to-stop-point' value to indicate that the Printer is in the process of canceling or aborting the job/document. Most implementations won't bother with this nuance.</p>
'6'	'processing-stopped' (J): The job has stopped while processing for any number of reasons and will return to the 'processing' state as soon as the reasons are no longer present.

~~The job's "job-state-reason" attribute MAY indicate why the job has stopped processing.~~

Value	Symbolic Name and Description
	<p>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'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>'canceled' (JD): The job/document has been canceled by a Cancel-Job/Cancel-Document operation and the Printer has completed canceling the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer is canceling the job/document, the job/document remains in its current state, but the job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' value and one of the 'canceled-by-user', 'canceled-by-operator', or 'canceled-at-device' value. When the job/document moves to the 'canceled' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'canceled-by-xxx', if present, MUST remain.</p>
'8'	<p>'aborted' (JD): The job/document has been aborted by the system, usually while the job/document was in the 'processing' or 'processing-stopped' state and the Printer has completed aborting the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer is aborting the job/document, the job/document remains in its current state, but the job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values. When the job/document moves to the 'aborted' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'aborted-by-system' value, if present, MUST remain.</p>
'9'	<p>'completed' (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>

1490 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
 1491 ~~job/document~~ altogether. The length of time that ~~jobs/documents~~ remain in the 'canceled', 'aborted', and 'completed'
 1492 states depends on implementation.

1493 ~~Jobs/Documents~~ reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the
 1494 ~~Jjobs/documents~~ has~~ve~~ completed all activity for the Document, including stacking output media, ~~after the~~
 1495 ~~jobs/documents have completed all activity~~, and all ~~job/d~~document status attributes have reached their final values
 1496 for the ~~job/document~~.

1497 **9.1.23.1 The "job-state" Job Description attribute and the Job Life Cycle**

1498 ~~The "job-state" attribute is one of the most important Job Description attributes. Figure 1 shows the values of the "job-~~
 1499 ~~state" attribute and the Job object life cycle as affected by actions on the Job, Printer, and job processing.~~

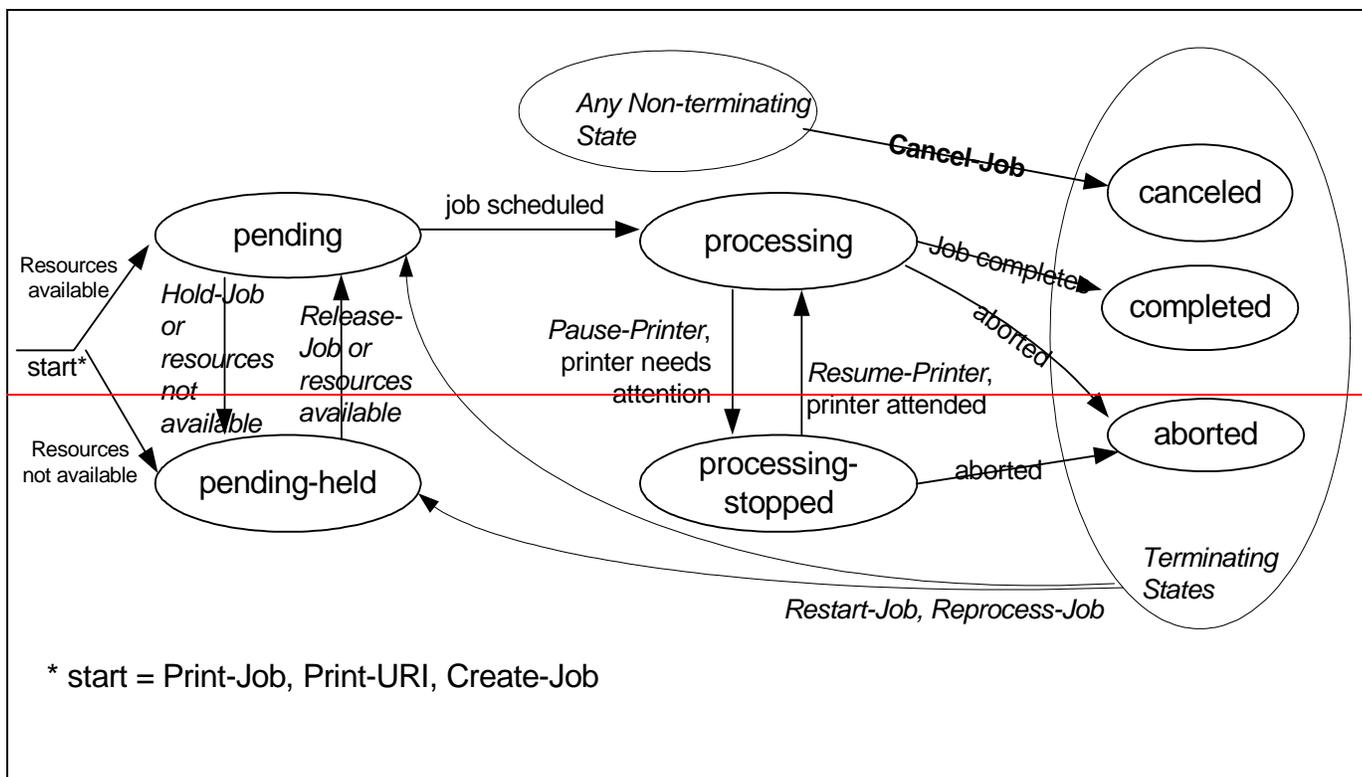


Figure 1 - The "job-state" Job Description attribute and the Job object life cycle

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

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9.1.23.29.1.23.1 The "document-state" Document Description attribute and the Document object life Cycle

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The "document-state" attribute is one of the most important Document Description attributes. Figure 2 shows the values of the "document-state" attribute and the Document object life cycle as affected by actions on the Job, Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the lifecycle of a Job⁶⁰. Documents basically have three states. The first is waiting to be processed by a Job (i.e. pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed, canceled, or aborted).

⁶⁰ 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 rules for how the various "document-state" values of all of the Job's document are rolled up to give a single value for the Job's "job-state" attribute. Instead, the Job state reflects the overall processing of the job and is the same whether or not the Document object is supported.

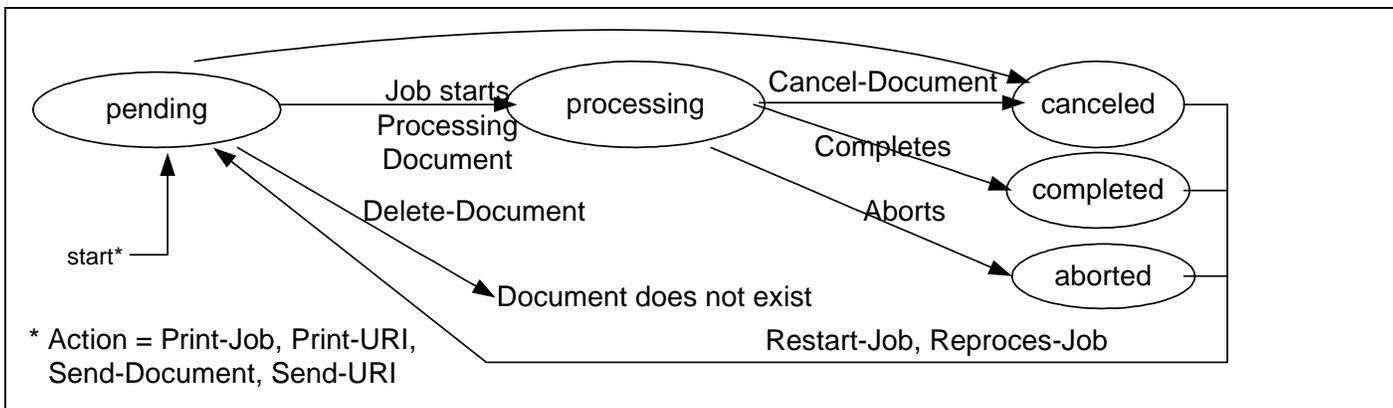


Figure 2 - The "document-state" Document Description attribute and the Document object life cycle

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

9.1.23.39.1.23.2 Forwarding Servers

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

9.1.23.4 Partitioning of Job/Document States

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

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

Job Retention: When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP Printer MAY "retain" the job in a restartable condition for an implementation-defined time period. This time period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see section 9.1.25) during the Job Retention phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-Documents operations MUST be supported while the job is in the Job Retention phase.

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

1546 ~~**Job Removal:** After the job has remained in the Job History for an implementation-defined time, such as when the~~
1547 ~~number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer~~
1548 ~~removes the Job and Document objects from the system.~~

1549 ~~Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" Operation~~
1550 ~~attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-~~
1551 ~~Documents operation and supplying the 'completed' value for the "which-jobs" Operation attribute, a client is~~
1552 ~~requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-~~
1553 ~~Document-Attributes operation, a client is requesting a job/documents in any phase except Job Removal. After Job~~
1554 ~~Removal, the Get-Job-Attributes/Get-Documents-Attributes and Get-Jobs/Get-Documents operations no longer are~~
1555 ~~capable of returning any information about a job/document.~~

1556 ~~NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.~~

1557 **9.1.24 document-state-message (text(MAX)) and job-state-message (text(MAX))**

1558 This OPTIONAL Document Description attribute specifies information about the "~~job-state"/~~"document-state" and "~~job-state-reasons"/~~"document-state-reasons" attributes in human readable text. If the Printer supports this attribute,
1559 the Printer MUST be able to generate this message in any of the natural languages identified by the Printer's
1560 "generated-natural-language-supported" attribute (see the "attributes-natural-language" Operation attribute specified
1561 in [rfc2911] Section 3.1.4.1).
1562

1563 The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-
1564 reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the
1565 (localized text). For such additional information such as interpreter errors for application program consumption or
1566 specific document access errors, new attributes with keyword values, needs to be developed and registered.

1567 **9.1.25 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2** 1568 **keyword)**

1569 The ~~REQUIRED "job-state-reasons" and the~~ REQUIRED "document-state-reasons" Document Description attributes
1570 provide additional information about ~~the job's and~~ each document's current state, i.e., information that augments the
1571 value of the ~~job's "job-state" attribute and each Document's "document-state" attribute, respectively.~~ The Printer
1572 ~~SHOULD support the same values for both the "job-state-reasons" and the "document-state-reasons" attribute for~~
1573 ~~those attributes that are defined for both as indicated in the "Job" and "Doc" columns in Table 13.~~

1574 These values MAY be used with any ~~job or~~ document state ~~or states~~ for which the reason makes sense. Some of
1575 these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when
1576 implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the
1577 reason no longer applies whether the value of the ~~Job's "job-state" attribute or the~~ Document's "document-state"
1578 attribute changed or not. When the ~~Job or~~ Document does not have any reasons for being in its current state, the
1579 value of the ~~Job's "job-state-reasons" attribute or~~ Document's "document-state-reasons" attribute MUST be 'none'.

1580 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1581 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1582 objects are passive objects operated on by the containing Job object.

1583 Note: While values cannot be added to the ~~"job-state" or~~ "document-state" attributes without impacting deployed
1584 clients that take actions upon receiving ~~"job-state" or~~ "document-state" values, it is the intent that additional ~~"job-~~
1585 ~~state-reasons" and~~ "document-state-reasons" values can be defined and registered without impacting such deployed
1586 clients. In other words, the ~~"job-state-reasons" and the~~ "document-state-reasons" attributes are intended to be
1587 extensible.

1588 ~~Table 13~~Table 13 lists the standard keyword values for the “~~job-state-reasons~~” and/or “document-state-reasons”
 1589 attributes defined in this and other IPP specifications as indicated in the References column. In ~~Table 13~~Table 13
 1590 the keywords are listed in alphabetic order (observing the “[job-]” prefix), while in their descriptions following ~~Table~~
 1591 ~~13~~Table 13, they are listed in the most likely order of occurrence to help understanding.

1592 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
 1593 level “job-state-reasons”, so that clients that do not support the Document object will receive the same information.
 1594 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
 1595 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
 1596 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1597 **Notation:**

1598 [job-] indicates a state reason keyword value that has the ‘job-‘ prefix when it is a value of the “job-state-reasons”
 1599 attribute, but does not have the ‘job-‘ prefix when it is a value of the “document-state-reasons” attribute⁶¹. For
 1600 purposes of sorting in ~~Table 13~~Table 13, the “[job-]” prefix is observed, ~~since this is an IPP specification~~.
 1601 “-” indicates that the Job or Document value is *not* defined.

1602 **Table 13 - “~~job-state-reasons~~” and “document-state-reasons” attribute values**

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
document-state-reasons	1setOf type2 keyword	MUST	9.1.25
	aborted-by-system	MAY	[rfc2911] §4.3.8
	compression-error	MAY	[rfc2911] §4.3.8
	digital-signature-did-not-verify	MAY	[jobx] §
	digital-signature-type-not-supported	MAY	[jobx] §
	document-access-error	MAY	[rfc2911] §4.3.8
	document-format-error	MAY	[rfc2911] §4.3.8
	[job-]canceled-at-device	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-operator	MAY	[rfc2911] §4.3.8
	[job-]canceled-by-user	MAY	[rfc2911] §4.3.8
	[job-]completed-successfully	MAY	[rfc2911] §4.3.8
	[job-]completed-with-errors	MAY	[rfc2911] §4.3.8
	[job-]completed-with-warnings	MAY	[rfc2911] §4.3.8
	[job-]data-insufficient	MAY	[rfc2911] §4.3.8
	[job-]digital-signature-wait	MAY	[jobx] §
	[job-]errors-detected	MAY	[jobx] §
	[job-]incoming	MAY	[rfc2911] §4.3.8
	[job-]interpreting	MAY	[rfc2911] §4.3.8
	[job-]outgoing	MAY	[rfc2911] §4.3.8
	[job-]printing	MAY	[rfc2911] §4.3.8
	[job-]queued	MAY	[rfc2911] §4.3.8
	[job-]queued-for-marker	MAY	[rfc2911] §4.3.8
	[job-]spooling	MAY	[ippsave] §8.3.1
	[job-]streaming	MAY	[ippsave] §8.3.1
	[job-]transforming	MAY	[rfc2911] §4.3.8
	[job-]warnings-detected	MAY	[pwg5100.4] §7.1
	none	MUST	[rfc2911] §4.3.8
	processing-to-stop-point	MAY	[rfc2911] §4.3.8

⁶¹ 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.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	queued-in-device	MAY	[rfc2911] §4.3.8
	resources-are-not-ready	MAY	[rfc2911] §4.3.8
	resources-are-not-supported	MAY	[pwg5100.3] §6.1
	submission-interrupted	MAY	[rfc2911] §4.3.8
	unsupported-compression	MUST	[rfc2911] §4.3.8
	unsupported-document-format	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 13 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. [rfc2911] §4.3.8

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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. [rfc2911] §4.3.8~~

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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. [ippsave] §8.3.1~~

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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. [ippsave] §8.3.1~~

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~~**'job-digital-signature-wait' (J):** The Job is currently being held because the Job was submitted with a "document-digital-signature" attribute value that is not supported. The operator MAY either cancel the job or release it to be processed. [jobx] §~~

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'digital-signature-did-not-verify' (JD): The ~~Job/~~Document contains a digital signature type that is supported (see section ~~Error! Reference source not found.~~ [JobX] §) but the signature did not verify when the Printer attempted to verify the signature. [jobx] §

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

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'resources-are-not-ready' (JD): At least one of the resources needed by the ~~job/~~document, such as media, fonts, resource objects, etc., is not ready on any of the physical printer's for which the ~~job/~~document is a candidate. This condition MAY be detected when the ~~job/~~document is accepted, or subsequently while the ~~job/~~document is pending or processing, depending on implementation. The

- 1642 | job ~~containing the~~ /document may remain in its current state or be moved to the 'pending-held' state,
1643 | depending on implementation and/or ~~job/document~~-scheduling policy. [rfc2911] §4.3.8
- 1644 | **'~~job-~~incoming' (JD):** ~~Either (1) the Printer has accepted the Create-Job operation and is expecting~~
1645 | ~~additional Send-Document and/or Send-URI operations or (2) T~~the Printer is retrieving/accepting
1646 | document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation.
1647 | [rfc2911] §4.3.8
- 1648 | **'~~job-~~spooling' (JD):** Same as 'job-incoming' with the specialization that the Printer is spooling the
1649 | ~~Job/~~Document data before processing it. This value corresponds to the 'spool' or 'automatic' value of
1650 | the "job-spooling-supported" Printer Description attribute. [ippsave] §8.3.1
- 1651 | **'~~job-~~streaming' (JD):** Same as 'job-incoming' with the specialization that the Printer is processing the
1652 | ~~Job/~~Document data as it is being received (that is, the document is not being spooled, but rather is
1653 | being processed in chunks by the output device and is being imaged during reception). This value
1654 | corresponds to the 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description
1655 | attribute. [ippsave] §8.3.1
- 1656 | **'~~job-~~data-insufficient' (J):** The ~~Create-Job operation has been accepted by the Printer, but the~~ Printer is
1657 | expecting additional document data before it can move the ~~job/document~~ into the 'processing' state.
1658 | If a Printer starts processing before it has received all data, the Printer removes the 'job-data-
1659 | insufficient' reason, but the 'job-incoming' remains. If a Printer starts processing after it has received
1660 | all data, the Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same
1661 | time. [rfc2911] §4.3.8
- 1662 | **'unsupported-compression' (JD):** The ~~job/document~~document was aborted by the system because the
1663 | Printer determined while attempting to decompress the document-data's that the compression is
1664 | actually not among those supported by the Printer. This value MUST be supported, since
1665 | "compressions is a REQUIRED Operation attribute. [rfc2911] §4.3.8
- 1666 | **'compression-error' (JD):** The ~~job/document~~document was aborted by the system because the Printer
1667 | encountered an error in the document-data while decompressing it. If the Printer posts this reason,
1668 | the document-data has already passed any tests that would have led to the 'unsupported-
1669 | compression' job-state-reason/document-state-reason. [rfc2911] §4.3.8
- 1670 | **'document-access-error' (JD):** After accepting a Print-URI or Send-URI request, the Printer could not
1671 | access ~~one or more the~~ documents ~~passed by~~ reference. This reason is intended to cover any file
1672 | access problem, including file does not exist and access denied because of an access control
1673 | problem. The Printer MAY also indicate the document access error using the "~~job-~~document-
1674 | access-errors" ~~Job-Printer~~ Description attribute (~~see the description of "job-document-access-errors"~~
1675 | ~~above~~). Whether the Printer aborts the ~~job/document~~document and moves the
1676 | ~~job/document~~document to the 'aborted' job state or prints all documents that are accessible and
1677 | moves the ~~job/document~~document to the 'completed' ~~job/document~~document state and adds the
1678 | 'completed-with-errors' value in the job's "job-state-reasons" or document's "document-state-
1679 | reasons" attribute depends on implementation and/or site policy. This value SHOULD be supported
1680 | if the Print-URI or Send-URI operations are supported. [rfc2911] §4.3.8
- 1681 | **'unsupported-document-format' (JD):** The ~~job/document~~document was aborted by the system because the
1682 | document-data's document-format is not among those supported by the Printer. If the client
1683 | specifies the document-format as 'application/octet-stream', the printer MAY abort the
1684 | ~~job/document~~document and post this reason even though the format is a member of the "document-
1685 | format-supported" printer attribute, but not among the auto-sensed document-formats. This value
1686 | MUST be supported, since "document-format" is a REQUIRED Operation attribute. [rfc2911] §4.3.8
- 1687 | **'document-format-error' (JD):** The ~~job/document~~document was aborted by the system because the Printer
1688 | encountered an error in the document-data while processing it. If the Printer posts this reason, the
1689 | document-data has already passed any tests that would have led to the 'unsupported-document-
1690 | format' job-state-reason/document-state-reason. [rfc2911] §4.3.8

- 1691 **'submission-interrupted' (JD):** The ~~job or~~ document was not completely submitted for some unforeseen
 1692 reason, such as: (1) the Printer has crashed before the job-document was closed by the client, (2)
 1693 the Printer or the document transfer method has crashed in some non-recoverable way before the
 1694 document data was entirely transferred to the Printer, (3) the client crashed or failed to close the job
 1695 before the time-out period. See the description of the "multiple-operation-time-out" Printer attribute in
 1696 [rfc2911] Section 4.4.31. [rfc2911] §4.3.8
- 1697 **'~~job-~~outgoing' (JD):** The Printer is transmitting the job/documentdocument to the output device. [rfc2911]
 1698 §4.3.8
- 1699 ~~'job-scheduling' (J): The printer is in the process of scheduling the processing for the Job. [ippsave] §8.3.1~~
- 1700 **'~~job-~~queued' (JD):** Job-Document is in the 'processing' state, but more specifically, the Printer has queued
 1701 the Document data. [rfc2911] §4.3.8
- 1702 **'~~job-~~transforming' (JD):** Job/documentDocument is in the 'processing' state, but more specifically, the
 1703 Printer is interpreting document data and producing another electronic representation. [ippsave]
 1704 §8.3.1
- 1705 **'~~job-~~interpreting' (JD):** Job/documentDocument is in the 'processing' state, but more specifically, the
 1706 Printer is interpreting the document data. [rfc2911] §4.3.8
- 1707 **'~~job-~~queued-for-marker' (JD):** Job/documentDocument is in ~~any of the 'pending-held', 'pending', or~~
 1708 'processing' states, but more specifically, the Printer has completed enough processing of the
 1709 document to be able to start marking and the job/documentdocument is waiting for the marker.
 1710 ~~Systems that require human intervention to release jobs using the Release-Job operation, put the job~~
 1711 ~~into the 'pending-held' job state. Systems that automatically select a job to use the marker put the~~
 1712 ~~job into the 'pending' job state or keep the job in the 'processing' job state while waiting for the~~
 1713 ~~marker, depending on implementation. All implementations put the job/documentdocument into (or~~
 1714 ~~back into) the 'processing' state when marking does begin. rfc2911] §4.3.8~~
- 1715 **'~~job-~~printing' (JD):** The output device is marking media. This value is useful for Printers which spend a
 1716 great deal of time processing (1) when no marking is happening and then want to show that marking
 1717 is now happening or (2) when the job/documentdocument is in the process of being canceled or
 1718 aborted while the job/documentdocument remains in the 'processing' state, but the marking has not
 1719 yet stopped so that impression or sheet counts are still increasing for the job/documentdocument.
 1720 [rfc2911] §4.3.8
- 1721 ~~'printer-stopped-partly' (J): The value of the Printer's "printer-state-reasons" attribute contains the value~~
 1722 ~~'stopped-partly'. [rfc2911] §4.3.8~~
- 1723 ~~'printer-stopped' (J): The value of the Printer's "printer-state" attribute is 'stopped'. [rfc2911] §4.3.8~~
- 1724 ~~'job-suspending' (J): The printer is in the process of moving the Job from a processing condition to a~~
 1725 ~~suspended condition where other jobs can be processed. [ippsave] §8.3.1~~
- 1726 ~~'job-suspended' (J): The job has been suspended while processing using the Suspend-Current-Job~~
 1727 ~~operation and other jobs can be processed on the Printer. The Job can be resumed using the~~
 1728 ~~Resume-Job operation which removes this value. Note: Documents cannot be suspended and there~~
 1729 ~~is no Suspend-Current-Documents operation. [adm-ops] §9.1~~
- 1730 ~~'job-suspended-by-operator' (J): The Job has been indefinitely suspended by the printer operator.~~
 1731 ~~[ippsave] §8.3.1~~
- 1732 ~~'job-suspended-by-user' (J): The Job has been indefinitely suspended by the user. [ippsave] §8.3.1~~
- 1733 ~~'job-suspended-by-system' (J): The Job has been indefinitely suspended by the Printer's system software~~
 1734 ~~during normal processing of the job. [ippsave] §8.3.1~~
- 1735 ~~'job-resuming' (J): The printer is in the process of moving the Job from a suspended condition to become a~~
 1736 ~~candidate for processing. [ippsave] §8.3.1~~

- 1737 **'~~job-~~canceled-by-user' (JD)**: The ~~job/document~~document was canceled by the owner of the job using the
 1738 ~~Cancel-Job/Cancel-Document~~ request, i.e., by a user whose authenticated identity is the same as
 1739 the value of the originating user that created the Job object, or by some other authorized end-user,
 1740 such as a member of the job owner's security group. ~~This 'job-canceled' value SHOULD be~~
 1741 ~~supported.~~The 'canceled-by-user' value SHOULD be supported for the "document-state-reasons"
 1742 attributes for use with the Cancel-Document. [rfc2911] §4.3.8
- 1743 **'~~job-~~canceled-by-operator' (JD)**: The ~~job/document~~document was canceled by the operator using the
 1744 ~~Cancel-Job/Cancel-Document~~ request, i.e., by a user who has been authenticated as having
 1745 operator privileges (whether local or remote). If the security policy is to allow anyone to cancel
 1746 anyone's ~~job/document~~document, then these values may be used when the ~~job/document~~document
 1747 is canceled by other than the owner of the job. For such a security policy, in effect, everyone is an
 1748 operator as far as canceling ~~jobs/~~documents is concerned. These values SHOULD be supported if
 1749 the implementation permits canceling by other than the owner of the job. [rfc2911] §4.3.8
- 1750 **'~~job-~~canceled-at-device' (JD)**: The ~~job/document~~document was canceled by an unidentified local user,
 1751 i.e., a user at a console at the device. This value SHOULD be supported if the implementation
 1752 supports canceling jobs/documents at the console. [rfc2911] §4.3.8
- 1753 **'aborted-by-system' (JD)**: The ~~job/document~~document (1) is in the process of being aborted, ~~or~~ (2) has
 1754 been aborted by the system and placed in the 'aborted' state, ~~or~~ (3) ~~has been aborted by the system~~
 1755 ~~and placed in the 'pending-held' state, so that a user or operator can manually try the job/document~~
 1756 ~~again.~~ This value SHOULD be supported. [rfc2911] §4.3.8
- 1757 **'processing-to-stop-point' (J)**: The requester has issued a ~~Cancel-Job/Cancel-Document~~ operation or the
 1758 Printer has aborted the ~~job/document~~document, but is still performing some actions on the
 1759 ~~job/document~~document until a specified stop point occurs or ~~job/document~~document
 1760 termination/cleanup is completed.
 1761 If the implementation requires some measurable time to cancel the ~~job/document~~document in the
 1762 'processing' or 'processing-stopped' ~~job/document~~document states, the Printer MUST use this value
 1763 to indicate that the Printer is still performing some actions on the ~~job/document~~document while the
 1764 ~~job/document~~document remains in the 'processing' ~~or 'processing-stopped'~~ state. After all the
 1765 ~~job/s/~~document's ~~job/document~~document description attributes have stopped incrementing, the
 1766 Printer moves the ~~job/document~~document from the 'processing' state to the 'canceled' or 'aborted'
 1767 ~~job/document~~document states. [rfc2911] §4.3.8
- 1768 **'~~service-off-line' (J)~~**: ~~The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the~~
 1769 ~~'pending-held' state. This situation could be true if the service's or document transform's input is~~
 1770 ~~impaired or broken.~~ [rfc2911] §4.3.8
- 1771 **'~~job-~~errors-detected' (JD)**: If the Printer supports these values, the Printer MUST add the value to "~~job-~~
 1772 ~~state-reasons~~" / "~~document-state-reasons~~" when it generates the first error message. That is, a
 1773 single occurrence of this value is present in the "~~job-state-reasons~~" / "~~document-state-reasons~~" if the
 1774 Printer has generated one or more errors. An error indicates loss of information, such as a page not
 1775 imaged. A warning indicates no loss of information (see '~~job-~~warnings-count' state reason). ~~[jobx] §~~
- 1776 **'~~job-~~warnings-detected' (JD)**: If the Printer supports these values, the Printer MUST add the value to "~~job-~~
 1777 ~~state-reasons~~" / "~~document-state-reasons~~" when it generates the first warning message. That is, a
 1778 single occurrence of this value is present in the "~~job-state-reasons~~" / "~~document-state-reasons~~" if the
 1779 Printer has generated one or more warnings. A warning indicates something did not go as expected,
 1780 but there was no loss of information. For example, a font substitution. An error indicates loss of
 1781 information (see '~~job-~~errors-count' state reason). ~~[jobx] §~~
- 1782 **'~~job-~~completed-successfully' (JD)**: The ~~job/document~~document completed successfully. There were no
 1783 warnings or errors in printing. This value SHOULD be supported. [rfc2911] §4.3.8
- 1784 **'~~job-~~completed-with-warnings' (JD)**: The print part of the ~~job/document~~document completed with
 1785 warnings (whether or not there were save errors). This value SHOULD be supported if the
 1786 implementation detects warnings. [rfc2911] §4.3.8

1787 '~~job-~~completed-with-errors' (JD): The print part of the ~~job/document~~document completed with errors (and
 1788 possibly warnings too) (whether or not there were save errors). This value SHOULD be supported if
 1789 the implementation detects errors. [rfc2911] §4.3.8

1790 '~~job-saving~~' (J): The Printer is transmitting the Job to the save location. This is similar to the 'job-printing'
 1791 value. [ippsave] §8.3.4

1792 '~~job-saved-successfully~~' (J): The Printer saved the Job successfully. [ippsave] §8.3.4

1793 '~~job-save-error~~' (J): The Printer did not save the Job successfully (whether or not it was printed successfully,
 1794 printed with warnings, printed with errors, or not printed). The Printer MUST ensure that none of the
 1795 saved job is accessible, if it was unable to successfully save all of the job. [ippsave] §8.3.4

1796 '~~job-restartable~~' (J): This job is retained (see the description of "job-state" above, specifically "Partitioning of
 1797 Job States") and is currently able to be restarted using the Restart Job operation (see [rfc2911]
 1798 Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer
 1799 MUST accept a Restart Job operation for that job. This value SHOULD be supported if the Restart
 1800 Job operation is supported. [rfc2911] §4.3.8

1801 '~~queued-in-device~~' (JD): The ~~job/document~~document has been forwarded to a device or print system that is
 1802 unable to send back status. The Printer sets the ~~job's/document's~~ "job-state"/"document-state"
 1803 attribute to '~~completed~~' and '~~completed~~' and adds the 'queued-in-device' value to the
 1804 ~~job's/document's~~ "job-state-reasons"/"document-state-reasons" attribute to indicate that the Printer
 1805 has no additional information about the ~~job/document~~document and never will have any better
 1806 information. See the description of the "job-state"/"document-state" attribute above, specifically the
 1807 portion on "Forwarding Servers". [rfc2911] §4.3.8

1808 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1809 9.1.26 document-uri (uri)

1810 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a
 1811 Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the
 1812 Send-URI operation (see section 4.2).

1813 9.1.27 impressions-completed-current-copy (integer(0:MAX))

1814 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
 1815 attribute (see [rfc3381] §4.4) applied to the Document object.

1816 9.1.28 [~~job-~~]detailed-status-message (1setOf text(MAX))

1817 This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the
 1818 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.10) applied to the
 1819 Document object.

1820 9.1.29 [~~job-~~]document-access-errors (1setOf text(MAX))

1821 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the
 1822 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] §4.3.11) applied to the
 1823 Document object.

1824 **9.1.30 [job]-errors-count (integer(0:MAX))**

1825 This OPTIONAL "errors-count" Document Description attribute counts the number of errors that the Printer
 1826 encounters while processing and printing the Document object. An error indicates loss of information, such as a
 1827 page not imaged. A warning indicates no loss of information (see [jobx] §4.3.11).

1828 **9.1.31 [job]-impressions (integer(0:MAX))**

1829 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
 1830 impressions" Job Description attribute (see [rfc2911] §4.3.17.2) applied to the Document object. The Printer sets
 1831 this Document Description attribute from the corresponding Operation attribute supplied by the client in the
 1832 Document Creation operation (see section **Error! Reference source not found.**).

1833 **9.1.32 [job]-impressions-completed (integer(0:MAX))**

1834 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the
 1835 corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] §4.3.18.2) applied to the
 1836 Document object.

1837 **9.1.33 [job]-k-octets (integer(0:MAX))**

1838 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-
 1839 octets" Job Description attribute (see [rfc2911] §4.3.17.1) applied to the Document object. The Printer sets this
 1840 Document Description attribute from the corresponding Operation attribute supplied by the client in the Document
 1841 Creation operation (see section **Error! Reference source not found.**).

1842 **9.1.34 [job]-k-octets-processed (integer(0:MAX))**

1843 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding
 1844 "job-k-octets-processed" Job Description attribute (see [rfc2911] §4.3.18.1) applied to the Document object.

1845 **9.1.35 [job]-media-sheets (integer(0:MAX))**

1846 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
 1847 media-sheets" Job Description attribute (see [rfc2911] §4.3.17.3) applied to the Document object. The Printer sets
 1848 this Document Description attribute from the corresponding Operation attribute supplied by the client in the
 1849 Document Creation operation (see section **Error! Reference source not found.**).

1850 **9.1.36 [job]-media-sheets-completed (integer(0:MAX))**

1851 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
 1852 media-sheets-completed" Job Description attribute (see [rfc2911] 4.3.18.3) applied to the Document object.

1853 **9.1.37 [job]-more-info (uri)**

1854 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-
 1855 more-info" Job Description attribute (see [rfc2911] §4.3.4) applied to the Document object.

1856 **9.1.38 [job]-printer-up-time (integer (1:MAX))**

1857 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the
 1858 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description
 1859 attribute (see [rfc2911] section 4.4.29).

1860 A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value
 1861 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes
 1862 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of
 1863 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-
 1864 xxx" event occurred by subtracting this difference from the client's wall-clock time.

1865 **9.1.39 [job-]warnings-count (integer(0:MAX))**

1866 This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding
 1867 "job-warnings-count" Job Description attribute (see [jobx] §.) applied to the Document object. See [pwg5100.4] §6.1.
 1868 A warning indicates something did not go as expected, but there was no loss of information. For example, a font
 1869 substitution. An error indicates loss of information (see section 9.1.30).

1870 **9.1.40 last-document (boolean)**

1871 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the
 1872 Job. See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation
 1873 attribute supplied by the client in the Document Creation operation (see section **Error! Reference source not**
 1874 **found.**).

1875 **9.1.41 output-device-assigned (name(127))**

1876 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
 1877 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

1878 **9.1.42 sheet-completed-copy-number (integer(0:MAX))**

1879 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
 1880 attribute (see [rfc3381] §4.2) applied to the Document object.

1881 **9.1.43 time-at-completed (integer (MIN:MAX))**

1882 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
 1883 attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

1884 **9.1.44 time-at-creation (integer (MIN:MAX))**

1885 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
 1886 attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

1887 **9.1.45 time-at-processing (integer (MIN:MAX))**

1888 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
 1889 attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

1890 **10 Printer attributes**

1891 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three
 1892 disjoint groups:
 1893

Job Template attributes (JT)	These Printer attributes are related directly to the "xxx" Job Template attributes
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	<p>that a client can supply in a Job Creation request as follows:</p> <ol style="list-style-type: none"> 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL omit the attribute. 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". <p>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'job-template'.</p>
Document Template attributes (DT)	<p>These Printer attributes are related directly to the "xxx" Document Template attributes that a client can supply in a Document Creation request as follows:</p> <ol style="list-style-type: none"> 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL omit the attribute. 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>These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: "requested-attributes" = 'document-template'.</p>
Printer Description attributes (PD)	<p>These Printer attributes describe the Printer, such as "printer-name" and "printer-location". Some of them are "xxx-supported" and "xxx-default" for Operation attributes that the client can supply in a Job Creation request.</p>
neither (-)	<p>These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.</p>

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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 10~~ **Table 10**. Only those few Printer attribute collection attributes that do not have a corresponding Job Template attributes show the member attributes in this table.

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

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
attributes-charset-supported	1setOf charset	PD	MUST	[this-spec] §1.1
attributes-natural-language-supported	1setOf naturalLanguage	PD	MUST	[this-spec] §1.1

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
charset-configured	charset	PD	MUST	[rfc2911] §4.4.17
charset-supported	1setOf charset	PD	MUST	[rfc2911] §4.4.18
color-supported	boolean	PD	MAY	[rfc2911] §4.4.26
compression-supported	type3 keyword	PD	MUST	[rfc2911] §4.4.32
copies-default	integer(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.5
copies-supported	rangeOfInteger(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.5
cover-back-default	collection	JT,DT	MAY	[pwg5100.3] §3.1.3
cover-back-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
cover-front-default	collection	JT,DT	MAY	[pwg5100.3] §3.1.3
cover-front-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
cover-type-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.1.2.1
document-charset-default	charset	PD	CMUST ⁶²	[jobx] §
document-charset-supported	1setOf charset	PD	CMUST ⁶²	[jobx] §
document-creation-attributes-supported	1setOf type2 keyword	PD	MUST	[this-spec] §10.1
document-digital-signature-default	type2 keyword	PD	MAY	[jobx] §
document-digital-signature-supported	1setOf type2 keyword	PD	MAY	[jobx] §z,.z.z
document-format-default	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
document-format-details-supported	1setOf type2 keyword	PD	CMUST ⁶³	[jobx] §
document-format-details-implemented	1setOf collection	PD	CMUST ⁶³	[jobx] §
document-format-supported	1setOf mimeMediaType	PD	MUST	[rfc2911] §4.4.22
document-format-varying-attributes	1setOf type2 keyword	PD	MAY	[rfc3380] §6.3
document-format-version-default	text(127)	PD	MAY	[jobx] §
document-format-version-supported	1setOf text(127)	PD	MAY	[jobx] §
document-natural-language-default	naturalLanguage	PD	MAY	[jobxthis-spec] § Error! Reference source not found. z.z.z
document-natural-language-supported	1setOf naturalLanguage	PD	MAY	[jobxthis-spec] § Error! Reference source not found. z.z.z
feed-orientation-default	type3 keyword	JT,DT	MAY	[ippsave] §5.1.1
feed-orientation-supported	1setOf type3 keyword	JT,DT	MAY	[ippsave] §5.1.2
finishings-col-default	collection	JT,DT	MAY	[pwg5100.3] §3.2.3
finishings-col-ready	1setOf collection	JT,DT	MAY	[pwg5100.3] §3.2.4
finishings-col-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.2.5
finishings-default	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishings-ready	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishings-supported	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishing-template-supported	1setOf name(MAX)	-	MAY	[pwg5100.3] §3.2.1.1

⁶² The Printer MUST support the “document-charset-default” and “document-charset-supported” Printer Description attributes, if the Printer supports a charset-ambiguous document format (see section **Error! Reference source not found.**).

⁶³ The Printer MUST support the “document-format-details-supported” and “document-format-details-implemented” Printer attributes if the Printer supports a packaging document format, such as application/zip or multipart/related.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
font-name-requested-default	name(MAX)	JT,DT	MAY	[ippsave] §5.2.1
font-name-requested-supported	1setOf name(MAX)	JT,DT	MAY	[ippsave] §5.2.2
font-size-requested-default	integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
font-size-requested-supported	1setOf integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
force-front-side-default	1setOf integer(1:MAX)	JT,DT	MAY	[pwg5100.3] §3.3
force-front-side-supported	rangeOfInteger(1:MAX)	JT,DT	MAY	[pwg5100.3] §3.3
generated-natural-language-supported	1setOf naturalLanguage	PD	MUST	[rfc2911] §4.4.20
imposition-template-default	type3 keyword name(MAX)	JT,DT	MAY	[pwg5100.3] §3.4
imposition-template-supported	1setOf (type3 keyword name(MAX))	JT,DT	MAY	[pwg5100.3] §3.4
insert-after-page-number-supported	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.1.1
insert-count-supported	rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.5.2.1
insert-sheet-default	1setOf collection	JT,DT	MAY	[pwg5100.3] §3.5.4
insert-sheet-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.5.5
ippget-event-life	integer(15:MAX)	PD	MAY	[get-method] §8.1
ipp-versions-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.20
job-account-id-default	name(MAX)	JT	MAY	[pwg5100.3] §3.6
job-account-id-supported	boolean	JT	MAY	[pwg5100.3] §3.6
job-accounting-output-bin-default	type3 keyword name(MAX)	-	MAY	[pwg5100.3] §3.8.3.1
job-accounting-output-bin-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.8.3.2
job-accounting-sheets-default	collection	JT	MAY	[pwg5100.3] §3.8.4
job-accounting-sheets-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.8.5
job-accounting-sheets-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.8.1.1
job-accounting-user-id-default	name(MAX)	JT	MAY	[pwg5100.3] §3.7
job-accounting-user-id-supported	boolean	JT	MAY	[pwg5100.3] §3.7
job-copies-default	integer(1:MAX)	JT	MAY	[jobxthis-spec] §z.z.z
job-copies-supported	reangeOfInteger(1:MAX)	JT	MAY	[jobxthis-spec] §z.z.z
job-cover-back-default	collection	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-cover-back-supported	1setOf type2 keyword	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-cover-front-default	collection	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-cover-front-supported	1setOf type2 keyword	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[ippsave] §7.1
job-error-sheet-default	collection	JT	MAY	[pwg5100.3] §3.7
job-error-sheet-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.9.5
job-error-sheet-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.9.1.1
job-error-sheet-when-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.9.2.1
job-finishings-default	1setOf type2 enum	JT	MAY	[jobxthis-spec] §Error! Reference source

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
				not found.z.z.z
job-finishings-supported	1setOf type2 enum	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-finishings-col-default	collection	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-finishings-col-supported	1setOf type2 keyword	JT	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
job-hold-until-default	type3 keyword name(MAX)	JT	MAY	[rfc2911] §4.2.2
job-hold-until-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[rfc2911] §4.2.2
job-impressions-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.34
job-k-octets-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.33
job-media-sheets-supported	rangeOfInteger(0:MAX)	PD	MAY	[rfc2911] §4.4.35
job-message-to-operator-default	text(MAX)	JT	MAY	[pwg5100.3] §3.12
job-message-to-operator-supported	boolean	JT	MAY	[pwg5100.3] §3.12
job-password-supported	integer(0:127)	PD	MAY	[ippsave] §7.2
job-password-encryption-supported	1setOf (type3 keyword name(MAX))	PD	MAY	[ippsave] §7.3
job-priority-default	integer(1:100)	JT	MAY	[rfc2911] §4.2.1
job-priority-supported	1setOf integer(1:100)	JT	MAY	[rfc2911] §4.2.1
job-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.2
job-sheet-message-default	text(MAX)	JT	MAY	[pwg5100.3] §3.12
job-sheet-message-supported	boolean	JT	MAY	[pwg5100.3] §3.12
job-sheets-col-default	collection	JT	MAY	[pwg5100.3] §3.11.3
job-sheets-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.11.4
job-sheets-default	type3 keyword name(MAX)	JT	MAY	[rfc2911] §4.2.3
job-sheets-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[rfc2911] §4.2.3
job-spooling-supported	type2 keyword	PD	MAY	[ippsave] §7.4
max-save-info-supported	integer(1:MAX)	PD	MAY	[ippsave] §7.5
max-stitching-locations-supported	integer(1:MAX)	PD	MAY	[pwg5100.3] §5.2
media-back-coating-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.10.2
media-col-database	1setOf collection	- ⁶⁴	MAY	[ippsave] §7.6
<i>any "media-col" member attribute</i>				
media-col-default	collection	JT	MAY	[pwg5100.3] §3.13.12
<i>any "media-col" member attribute</i>				
media-color-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.13.4.1
media-col-ready	1setOf collection	JT	MAY	[pwg5100.3] §3.13.13
<i>any "media-col" member attribute</i>				
media-col-supported	1setOf type2 keyword	JT	MAY	[pwg5100.3] §3.13.14
media-default	type3 keyword name(MAX)	JT,DT	MAY	[rfc2911] §4.2.11
media-front-coating-supported	1setOf (type3 keyword	-	MAY	[pwg5100.3]

⁶⁴ The Printer does not return the "media-col-database" attribute when the client requests 'all' or 'printer-description' attribute group because there MAY be a large number of values. Instead the client MUST query "media-col-database" explicitly in a Get-Printer-Attributes request.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
	name(MAX))			§3.13.10.1
media-hole-count-supported	1setOf rangeOfInteger(0:MAX)	-	MAY	[pwg5100.3] §3.13.6.1
media-info-supported	boolean	-	MAY	[pwg5100.3] §3.13.3.1
media-input-tray-check-default	type3 keyword name(MAX)	JT	MAY	[pwg5100.3] §3.14
media-input-tray-check-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[pwg5100.3] §3.14
media-key-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.1.1
media-order-count-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.7.1
media-pre-printed-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.5.1
media-ready	1setOf (type3 keyword name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
media-recycled-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.11.1
media-size-supported	1setOf collection	-	MAY	[pwg5100.3] §3.13.8.3
media-supported	1setOf (type3 keyword name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
media-weight-metric-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.9.1
multiple-document-handling-default	type2 keyword	JT	MUST ⁶⁵	[rfc2911] §4.2.4
multiple-document-handling-supported	1setOf type2 keyword	JT	MUST ⁶⁵	[rfc2911] §4.2.4
multiple-document-jobs-supported	boolean	PD	MUST ⁶⁵	[rfc2911] §4.4.16
multiple-operation-time-out	integer(1:MAX)	PD	MUST ⁶⁵	[rfc2911] §4.4.31
natural-language-configured	naturalLanguage	PD	MUST	[rfc2911] §4.4.19
notify-attributes-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.4
notify-events-default	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-events-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-lease-duration-default	integer(0:67108863)	PD	MAY	[ntfy] §5.3.8
notify-lease-duration-supported	1setOf (integer(0: 67108863) rangeOfInteger(0:67108863))	PD	MAY	[ntfy] §5.3.8
notify-lease-expiration-time	integer(0:MAX)	PD	MAY	[ntfy] §5.4.3
notify-max-events-supported	integer(2:MAX)	PD	MAY	[ntfy] §5.3.3
notify-pull-method-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.2
notify-schemes-supported	1setOf uriScheme	PD	MAY	[ntfy] §5.3.1
number-up-default	integer(1:MAX)	JT,DT	MAY	[rfc2911] §4.2.9
number-up-supported	1setOf (integer(1:MAX) rangeOfInteger(1:MAX))	JT,DT	MAY	[rfc2911] §4.2.9
operations-supported	1setOf type2 enum	PD	MUST	[rfc2911] §4.4.15
orientation-requested-default	type2 enum	JT,DT	MAY	[rfc2911] §4.2.10
orientation-requested-supported	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.10
output-bin-default	type2 keyword name(MAX)	JT	MAY	[pwg5100.2] §2.1

⁶⁵ A Printer MUST support "multiple-document-handling-default", "multiple-document-handling-default", "multiple-document-jobs-supported", and "multiple-operation-time-out" Printer attributes since the Printer MUST support multiple document jobs, even though they are OPTIONAL for a Printer to conform to [rfc2911].

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
output-bin-supported	1setOf (type2 keyword name(MAX))	JT	MAY	[pwg5100.2] §2.1
output-device-requested-supported	1setOf name(127)	PD	MAY	[jobxthis-spec] §Error! Reference source not found.z.z.z
page-delivery-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.15
page-delivery-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.15
page-order-received-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.16
page-order-received-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.16
page-overrides-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.4] §5.2.9
page-ranges-supported	boolean	JT,DT	MAY	[rfc2911] §4.2.7
pages-per-minute	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.36
pages-per-minute-color	integer(0:MAX)	PD	MAY	[rfc2911] §4.4.37
pages-per-subset-supported	boolean	PD	MAY	[pwg5100.4] §5.3.2
parent-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.2
pdl-override-supported	type2 keyword	PD	MUST	[rfc2911] §4.4.28 [ippsave] §8.1
presentation-direction-number-up-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.17
presentation-direction-number-up-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.17
printer-current-time	dateTime	PD	MAY	[rfc2911] §4.4.30
printer-detailed-status-messages	1setOf text(MAX)	PD	MAY	[ippsave] §7.7
printer-driver-installer	uri	PD	MAY	[rfc2911] §4.4.8
printer-info	text(127)	PD	MAY	[rfc2911] §4.4.6
printer-is-accepting-jobs	boolean	PD	MUST	[rfc2911] §4.4.23
printer-location	text(127)	PD	MAY	[rfc2911] §4.4.5
printer-make-and-model	text(127)	PD	MAY	[rfc2911] §4.4.9
printer-message-date-time	dateTime	PD	MAY	[rfc3380] §6.5
printer-message-from-operator	text(127)	PD	MAY	[rfc2911] §4.4.25
printer-message-time	integer(MIN:MAX)	PD	MAY	[rfc3380] §6.4
printer-more-info	uri	PD	MAY	[rfc2911] §4.4.7
printer-more-info-manufacturer	uri	PD	MAY	[rfc2911] §4.4.10
printer-name	name(127)	PD	MUST	[rfc2911] §4.4.4
printer-notify-server-uri	uri	PD	MAY	[not-srv] §4.1
printer-resolution-default	resolution	JT,DT	MAY	[rfc2911] §4.2.12
printer-resolution-supported	1setOf resolution	JT,DT	MAY	[rfc2911] §4.2.12
printer-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.1
printer-state	type1 enum	PD	MUST	[rfc2911] §4.4.11
printer-state-change-date-time	dateTime	PD	MAY	[ntfy] §6.2
printer-state-change-time	integer(1:MAX)	PD	MAY	[ntfy] §6.1
printer-state-message	text(MAX)	PD	MAY	[rfc2911] §4.4.13
printer-state-reasons	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.12
printer-up-time	integer(1:MAX))	PD	MUST	[rfc2911] §4.4.29
printer-uri-supported	1setOf uri	PD	MUST	[rfc2911] §4.4.1
printer-xri-supported	1setOf collection	PD	MAY	[rfc3380] §6.6
xri-uri	uri	PD	MUST	[rfc3380] §6.6
xri-authentication	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
xri-security	1setOf type2 keyword	PD	MUST	[rfc3380] §6.6
print-quality-default	type2 enum	JT,DT	MAY	[rfc2911] §4.2.13

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
print-quality-supported	1setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.13
queued-job-count	integer(0:MAX)	PD	MUST	[rfc2911] §4.4.24
reference-uri-schemes-supported	1setOf uriScheme	PD	MUST ⁶⁶	[rfc2911] §4.4.27
separator-sheets-default	collection	JT,DT	MAY	[pwg5100.3] §3.18.3
separator-sheets-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.18.4
separator-sheets-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.18.1.1
sheet-collate-default	type2 keyword	JT,DT	MAY	[rfc3381] §3.1
sheet-collate-supported	1setOf type2 keyword	JT,DT	MAY	[rfc3381] §3.1
sides-default	type2 keyword	JT,DT	MAY	[rfc2911] §4.2.8
sides-supported	1setOf type2 keyword	JT,DT	MAY	[rfc2911] §4.2.8
stitching-locations-supported	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.3.1
stitching-offset-supported	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))	-	MAY	[pwg5100.3] §3.2.2.2.1
stitching-reference-edge-supported	1setOf type2 keyword	-	MAY	[pwg5100.3] §3.2.2.1.1
subordinate-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.1
uri-authentication-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.2
uri-security-supported	1setOf type2 keyword	PD	MUST	[rfc2911] §4.4.3
user-defined-values-supported	1setOf type2 keyword	PD	MAY	[pwg5100.3] §5.1
which-jobs-supported	1setOf type2 keyword	PD	MAY	[ippsave] §7.8
x-image-position-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.2
x-image-position-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.2
x-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.3
x-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.3
xri-authentication-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.8
xri-security-supported	1setOf type2 keyword	PD	MAY	[rfc3380] §6.9
xri-uri-scheme-supported	1setOf uriScheme	PD	MAY	[rfc3380] §6.7
x-side1-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.4
x-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.4
x-side2-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.5
x-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.5
y-image-position-default	type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.6
y-image-position-supported	1setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.19.6
y-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.7
y-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.7
y-side1-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.8
y-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.8
y-side2-image-shift-default	integer(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.9
y-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT,DT	MAY	[pwg5100.3] §3.19.9

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1918

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

⁶⁶ The Printer MUST support “reference-uri-scheme-supported” Printer Description attribute, since the Send-URI operation is REQUIRED.

1919 **10.1attributes-charset-supported (1setOf charset)**

1920 This REQUIRED Printer Description attribute indicates the charsets that the Printer supports as values of text and
 1921 name attributes, that is, supports as values of the “attributes-charset” Operation attribute ([rfc2911] section 3.1.4),
 1922 Job Description ([rfc2911] section 4.3.19), and Document Description attributes (section 9.1.1).

1923 **10.2attributes-natural-language-supported (1setOf naturalLanguage)**

1924 This REQUIRED Printer Description attribute indicates the natural languages that the Printer supports as values of
 1925 test and name attributes, that is, supports as values of the “attributes-natural-language” Operation attribute ([rfc2911]
 1926 section 3.1.4), Job Description ([rfc2911] section 4.3.20), and Document Description attributes (section 9.1.2).

1927 **10.310.1 document-creation-attributes-supported (1setOf type2 keyword)**

1928 This REQUIRED Printer Description attribute lists the keyword names of the Document Template and Operation
 1929 attributes that the Printer will accept in the ~~Create-Document~~, ~~Send-Document~~, and ~~Send-URI Document Creation~~
 1930 operations.

1931 **10.4printer-state-reasons (1setOf type2 keyword)**

1932 This Printer Description attribute augments the “printer-state” of the Printer with additional information about the state
 1933 of the Printer. Table 15 lists all of the values defined for the “printer-state-reasons” Printer Description attribute.

1934 **Table 15 – Values of the “printer-state-reasons” Printer attribute**

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
printer-state-reasons	1setOf type2 keyword	MUST	[rfc2911] §4.4.12
	other	MAY	[rfc2911] §4.4.12
	none	MUST	[rfc2911] §4.4.12
	connecting-to-device	MAY	[rfc2911] §4.4.12
	cover-open	MAY	[rfc2911] §4.4.12
	deactivated	MAY	[adm-ops] §8.2
	developer-empty	MAY	[rfc2911] §4.4.12
	developer-low	MAY	[rfc2911] §4.4.12
	door-open	MAY	[rfc2911] §4.4.12
	fuser-over-temp	MAY	[rfc2911] §4.4.12
	fuser-under-temp	MAY	[rfc2911] §4.4.12
	hold-new-jobs	MAY	[adm-ops] §8.1
	input-tray-missing	MAY	[rfc2911] §4.4.12
	interlock-open	MAY	[rfc2911] §4.4.12
	interpreter-resource-unavailable	MAY	[rfc2911] §4.4.12
	marker-supply-empty	MAY	[rfc2911] §4.4.12
	marker-supply-low	MAY	[rfc2911] §4.4.12
	marker-waste-almost-full	MAY	[rfc2911] §4.4.12
	marker-waste-full	MAY	[rfc2911] §4.4.12
	media-empty	MAY	[rfc2911] §4.4.12
	media-jam	MAY	[rfc2911] §4.4.12

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
	media-low	MAY	[rfc2911] §4.4.12
	media-needed	MAY	[rfc2911] §4.4.12
	moving-to-paused	CMUST ⁶⁷	[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 ⁶⁸	[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

1935

1936 This description is taken from [rfc2911] with additions from other IPP extension documents:

1937 This REQUIRED Printer attribute supplies additional detail about the device's state. Some of these value
 1938 definitions indicate conformance requirements; the rest are OPTIONAL.

1939 Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe),
 1940 warning, and error (most severe).

1941 **'-report'**: This suffix indicates that the reason is a "report". An implementation may choose to omit some or
 1942 all reports. Some reports specify finer granularity about the printer state; others serve as a precursor
 1943 to a warning. A report MUST contain nothing that could affect the printed output.

1944 **'-warning'**: This suffix indicates that the reason is a "warning". An implementation may choose to omit some
 1945 or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that
 1946 prevents a job from completing, though in some cases the output may be of lower quality.

1947 **'-error'**: This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this
 1948 attribute contains one or more errors, printer MUST be in the stopped state.

1949 If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an
 1950 "error".

1951 If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the
 1952 output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a
 1953 warning in the Printer's "printer-state-reasons attribute". If the "printer-state" for such a Printer has a value of
 1954 'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.

1955 The following standard keyword values are defined (in alphabetical order):

⁶⁷ The Printer MUST support the 'moving-to-paused' value if the Printer supports the Pause-Printer operation and the Printer takes significant time to move to paused.

⁶⁸ The Printer MUST support the 'paused' value if the Printer supports the Pause-Printer operation.

- 1956 ~~'other': The device has detected an error other than one listed in this document.~~
- 1957 ~~'none': There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without~~
- 1958 ~~any value and MUST be used, since the 1setOf attribute syntax requires at least one value.~~
- 1959 ~~'connecting-to-device': The Printer object has scheduled a job on the output device and is in the process of~~
- 1960 ~~connecting to a shared network output device (and might not be able to actually start printing the job~~
- 1961 ~~for an arbitrarily long time depending on the usage of the output device by other servers on the~~
- 1962 ~~network).~~
- 1963 ~~'cover-open': One or more covers on the device are open.~~
- 1964 ~~'deactivated': A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]~~
- 1965 ~~section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.~~
- 1966 ~~The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-~~
- 1967 ~~Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URL (so that partial job submission can~~
- 1968 ~~be completed – see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status~~
- 1969 ~~code.~~
- 1970 ~~'developer-empty': The device is out of developer.~~
- 1971 ~~'developer-low': The device is low on developer.~~
- 1972 ~~'door-open': One or more doors on the device are open.~~
- 1973 ~~'fuser-over-temp': The fuser temperature is above normal.~~
- 1974 ~~'fuser-under-temp': The fuser temperature is below normal.~~
- 1975 ~~'hold-new-jobs': The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or~~
- 1976 ~~other means, but the output device(s) are taking an appreciable time to stop. Later, when all output~~
- 1977 ~~has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-~~
- 1978 ~~paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-~~
- 1979 ~~New-Jobs operation is supported and the implementation takes significant time to pause a device in~~
- 1980 ~~certain circumstances.~~
- 1981 ~~'input-tray-missing': One or more input trays are not in the device.~~
- 1982 ~~'interlock-open': One or more interlock devices on the printer are unlocked.~~
- 1983 ~~'interpreter-resource-unavailable': An interpreter resource is unavailable (i.e. font, form)~~
- 1984 ~~'marker-supply-empty': The device is out of at least one marker supply. (e.g. toner, ink, ribbon)~~
- 1985 ~~'marker-supply-low': The device is low on at least one marker supply. (e.g. toner, ink, ribbon)~~
- 1986 ~~'marker-waste-almost-full': The device marker supply waste receptacle is almost full.~~
- 1987 ~~'marker-waste-full': The device marker supply waste receptacle is full.~~
- 1988 ~~'media-empty': At least one input tray is empty.~~
- 1989 ~~'media-jam': The device has a media jam.~~
- 1990 ~~'media-low': At least one input tray is low on media.~~
- 1991 ~~'media-needed': A tray has run out of media.~~
- 1992 ~~'moving-to-paused': Someone has paused the Printer object using the Pause-Printer operation (see~~
- 1993 ~~[rfc2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.~~
- 1994 ~~Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value~~
- 1995 ~~replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be~~
- 1996 ~~supported, if the Pause-Printer operation is supported and the implementation takes significant time~~
- 1997 ~~to pause a device in certain circumstances.~~
- 1998 ~~'opc-life-over': The optical photo conductor is no longer functioning.~~

- 1999 ~~'opc-near-eol': The optical photo-conductor is near end of life.~~
- 2000 ~~'output-area-almost-full': One or more output area is almost full (e.g. tray, stacker, collator).~~
- 2001 ~~'output-area-full': One or more output area is full. (e.g. tray, stacker, collator)~~
- 2002 ~~'output-tray-missing': One or more output trays are not in the device~~
- 2003 ~~'paused': Someone has paused the Printer object using the Pause-Printer operation (see [rfc2911] section~~
- 2004 ~~3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer~~
- 2005 ~~MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a~~
- 2006 ~~Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that~~
- 2007 ~~job when the Printer is no longer paused and leave no evidence in the printed output of such a~~
- 2008 ~~pause. This value MUST be supported, if the Pause-Printer operation is supported.~~
- 2009 ~~'shutdown': Someone has removed a Printer object from service, and the device may be powered down or~~
- 2010 ~~physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the~~
- 2011 ~~Printer object is realized by a print server that is still active, the Printer object MUST perform no other~~
- 2012 ~~operations requested by a client, including returning this value. If a Printer object had been printing a~~
- 2013 ~~job when it was shutdown, the Printer MAY resume printing that job when the Printer is no longer~~
- 2014 ~~shutdown. If the Printer resumes printing such a job, it MAY leave evidence in the printed output of~~
- 2015 ~~such a shutdown, e.g. the part printed before the shutdown MAY be printed a second time after the~~
- 2016 ~~shutdown.~~
- 2017 ~~'spool-area-full': The limit of persistent storage allocated for spooling has been reached. The Printer is~~
- 2018 ~~temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept~~
- 2019 ~~more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small~~
- 2020 ~~number jobs at a time or a spooling Printer that has filled the spool space.~~
- 2021 ~~'stopped-partly': When a Printer object controls more than one output device, this reason indicates that one~~
- 2022 ~~or more output devices are stopped. If the reason is a report, fewer than half of the output devices~~
- 2023 ~~are stopped. If the reason is a warning, fewer than all of the output devices are stopped.~~
- 2024 ~~'stopping': The Printer object is in the process of stopping the device and will be stopped in a while. When~~
- 2025 ~~the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The~~
- 2026 ~~'stopping-warning' reason is never an error, even for a Printer with a single output device. When an~~
- 2027 ~~output device ceases accepting jobs, the Printer will have this reason while the output device~~
- 2028 ~~completes printing.~~
- 2029 ~~'timed-out': The server was able to connect to the output device (or is always connected), but was unable to~~
- 2030 ~~get a response from the output device.~~
- 2031 ~~'toner-empty': The device is out of toner.~~
- 2032 ~~'toner-low': The device is low on toner.~~

2033 11 New Values for Existing Printer Description Attributes

2034 This section contains those attributes for which additional values are added.

2035 11.1 operations-supported (1setOf type2 enum)

2036 The following "operation-id" values are added in order to support the new operations defined in this document:

2037

Table 16 – Operation-id assignments

Value	Operation Name	Reference
0x0033	Cancel-Document	[this-spec] §4.5
0x0034	Get-Document-Attributes	[this-spec] §4.3
0x0035	Get-Documents	[this-spec] §3.3
0x0036	Delete-Document	[this-spec] §5.4
0x0037	Set-Document-Attributes	[this-spec] §4.4

2038

2039 **12 Encodings of Additional Attribute Tags**

2040 This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910]).

2041 The “document-attributes-tag” delimits Document Template Attributes Groups in requests and Document Attributes
2042 Groups in responses.

2043 The following table specifies the values for the delimiter tag:

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

2044

2045 **13 Status codes**

2046 [This section defines additional status codes for use with multi-document jobs.](#)

2047 **13.1 server-error-too-many-jobs (0x050B)**

2048 [The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity](#)
2049 [of the Printer and/or the policy for this user or type of job. The client SHOULD NOT try again later.](#)

2050 **13.2 server-error-too-many-documents (0x050C)**

2051 [The client has attempted to create a Document using any of the Document Creation operations which would exceed](#)
2052 [the capacity of the Printer for this Job and/or the policy for this user or type of job. The client SHOULD NOT try again](#)
2053 [later.](#)

2054 **14 Conformance Requirements**

2055 This section specifies the conformance requirements for Printers and clients.

2056 **14.1 Printer conformance requirements**

2057 In order to conform to this specification, a Printer:

- 2058 1. MUST meet the conformance requirements for Printers specified in [rfc2911].

- 2059 2. MUST support the Job operation that section 3 REQUIRES a Printer to support.
- 2060 3. MUST support the Document operations that section 4 REQUIRES a Printer to support.
- 2061 4. MAY support any of the Administrative operations in section 5.
- 2062 5. MUST support the Attribute Precedence semantics specified in section 6 for the levels that the Printer
2063 supports.
- 2064 6. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI
2065 operation that section 7 REQUIRES a Printer to support.
- 2066 7. MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the
2067 corresponding Document Description attributes that section 9 REQUIRES a Printer to support and any
2068 "xxx-default" and "xxx-supported" Printer attributes that section 10 REQUIRES a Printer to support.
- 2069 8. MAY support any of the Document Template attributes in Document Creation operations as indicated in
2070 section 8 and MUST NOT support them for contexts for where they are not defined as indicated in the
2071 [Table 11](#)~~Table 11~~ with an "-".
- 2072 9. MUST support the Document Description attributes that section 9 REQUIRES a Printer to support.
- 2073 10. MUST support the Printer attributes that section 10 REQUIRES a Printer to support.
- 2074 11. MUST support the values of Printer Description attributes that section 11 REQUIRES a Printer to
2075 support.

2076 14.2 Client conformance requirements

2077 In order to conform to this specification, a client:

- 2078 1. MUST meet the conformance requirements for clients specified in [rfc2911]
- 2079 2. MAY support any of the Document operations defined in section 3.8.
- 2080 3. MUST supply the Operation attributes that section 7 REQUIRES a client to supply in operation requests.
- 2081 4. MUST supply any Document Template attributes in the format that section 8 REQUIRES a client to supply in
2082 Document Creation operations and MUST NOT support them for contexts for where they are not defined as
2083 indicated in the [Table 11](#)~~Table 11~~ with an "n".
- 2084 5. SHOULD support any of the Document Description attributes that section 9 REQUIRES a Printer to support.
- 2085 6. MAY support any of the Printer attributes listed in section 10.
- 2086 7. MAY support any of the values of the Printer Descriptions attributes in section 11.

2087 **15 Normative References**

2088 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
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2221 17 IANA Considerations

2222 This section contains the registration information for IANA to add to the various IPP Registries according to the
 2223 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
 2224 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations-registry>.

2225 *Note to the RFC Editor: Replace the References below to [this spec] with the RFC number for the appropriate*
 2226 *document, so that it accurately reflects the content of the information for the IANA Registry.*

2227 **17.1 Attribute Registrations**

2228 The following table lists all the attributes defined in this specification. These are to be registered according to the
 2229 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
 2230 specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also
 2231 being Document Template attributes. However, the definitions of these Document Template attributes are not
 2232 duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 8 which contains
 2233 a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).
 2234 This table contains the reference in another specification that completely defines each attribute. These Document
 2235 Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a
 2236 reference to this specification and Section 8.

2238	Attribute Name (attribute syntax)	Reference	Section
2239	-----	-----	-----
2240	Document Description attributes:		
2241	attributes-charset (charset)	[this spec]	9.1.1
2242	attributes-natural-language (naturalLanguage)	[this spec]	9.1.2
2243	compression (type3 keyword)	[this spec]	9.1.3
2244	current-page-order (type2 keyword)	[this spec]	9.1.4
2245	date-time-at-completed (dateTime)	[this spec]	9.1.5
2246	date-time-at-creation (dateTime)	[this spec]	9.1.6
2247	date-time-at-processing (dateTime)	[this spec]	9.1.7
2248	detailed-status-message (1setOf text (MAX))	[this spec]	9.1.28
2249	document-access-errors (1setOf text(MAX))	[this spec]	9.1.29
2250	<u>document-charset (charset)</u>	<u>[this spec]</u>	9.1.8
2251	<u>document-digital-signature (type2 keyword)</u>	<u>[this spec]</u>	9.1.9
2252	document-format (mimeMediaType)	[this spec]	9.1.8
2253	<u>document-format-details (collection)</u>	<u>[this spec]</u>	9.1.11
2254	<u>document-source-application-name (name(MAX))</u>	<u>[this spec]</u>	Error!
2255	Reference source not found.		
2256	<u>document-source-application-version (text(127))</u>		
2257		<u>[this spec]</u>	Error!
2258	Reference source not found.		
2259	<u>document-source-os-name (name(40))</u>	<u>[this spec]</u>	Error!
2260	Reference source not found.		
2261	<u>document-source-os-version (text(40))</u>	<u>[this spec]</u>	Error!
2262	Reference source not found.		
2263	<u>document-format (mimeMediaType)</u>	<u>[this spec]</u>	Error!
2264	Reference source not found.		
2265	<u>document-format-device-id (text(127))</u>	<u>[this spec]</u>	Error!
2266	Reference source not found.		
2267	<u>document-format-version (text(127))</u>	<u>[this spec]</u>	Error!
2268	Reference source not found.		
2269	<u>document-natural-language (1setOf naturalLanguage)</u>		
2270		<u>[this spec]</u>	Error!
2271	Reference source not found.		
2272	<u>document-format-details-detected (1setOf collection)</u>		
2273		<u>[this spec]</u>	9.1.12

2274	<u>document-format-detected (mimeMediaType)</u>	[this spec]	9.1.13
2275	<u>document-format-version (text(127))</u>	[this spec]	9.1.14
2276	<u>document-format-version-detected (text(127))</u>	[this spec]	9.1.15
2277	document-job-id (integer(1:MAX))	[this spec]	9.1.11
2278	document-job-uri (uri)	[this spec]	9.1.17
2279	document-message (text(MAX))	[this spec]	9.1.18
2280	document-name (name(MAX))	[this spec]	9.1.19
2281	document-natural-language (naturalLanguage)	[this spec]	9.1.20
2282	document-number (integer(0:MAX))	[this spec]	9.1.21
2283	document-printer-uri (uri)	[this spec]	9.1.22
2284	document-state (type1 enum)	[this spec]	9.1.23
2285	document-state-message (text(MAX))	[this spec]	9.1.24
2286	document-state-reasons (1setOf type2 keyword)	[this spec]	9.1.25
2287	document-uri (uri)	[this spec]	9.1.26
2288	impressions (integer(0:MAX))	[this spec]	9.1.31
2289	impressions-completed (integer(0:MAX))	[this spec]	9.1.32
2290	impressions-completed-current-copy (integer(0:MAX))		
2291		[this spec]	9.1.27
2292	k-octets (integer(0:MAX))	[this spec]	9.1.33
2293	k-octets-processed (integer(0:MAX))	[this spec]	9.1.34
2294	last-document (boolean)	[this spec]	9.1.39
2295	media-sheets (integer(0:MAX))	[this spec]	9.1.35
2296	media-sheets-completed (integer(0:MAX))	[this spec]	9.1.36
2297	more-info (uri)	[this spec]	9.1.37
2298	output-device-assigned (name(127))	[this spec]	9.1.41
2299	printer-up-time (integer (1:MAX))	[this spec]	9.1.38
2300	sheet-completed-copy-number (integer(0:MAX))	[this spec]	9.1.42
2301	time-at-completed (integer (MIN:MAX))	[this spec]	9.1.43
2302	time-at-creation (integer (MIN:MAX))	[this spec]	9.1.44
2303	time-at-processing (integer (MIN:MAX))	[this spec]	9.1.45
2304			
2305			
2306	Document Templates attributes:		
2307	ACTION (Tom) - Need to add the xxx-default and xxx-supported for each.		
2308	copies (integer(1:MAX))	[this spec]	8
2309	cover-back (collection)	[this spec]	8
2310	cover-type (type2 keyword)	[this spec]	8
2311	media (type3 keyword name(MAX))	[this spec]	8
2312	media-col (collection)	[this spec]	8
2313	cover-front (collection)	[this spec]	8
2314	cover-type (type2 keyword)	[this spec]	8
2315	media (type3 keyword name(MAX))	[this spec]	8
2316	media-col (collection)	[this spec]	8
2317	feed-orientation (type3 keyword)	[this spec]	8
2318	finishings (1setOf type2 enum)	[this spec]	8
2319	finishings-col (collection)	[this spec]	8

2320	finishing-template (name(MAX))	[this spec]	8
2321	stitching (collection)	[this spec]	8
2322	stitching-locations (1setOf integer(0:MAX))	[this spec]	8
2323	stitching-offset (integer (0:MAX))	[this spec]	8
2324	stitching-reference-edge (type2 keyword)	[this spec]	8
2325	font-name-requested (name(MAX))	[this spec]	8
2326	font-size-requested (integer(1:MAX))	[this spec]	8
2327	force-front-side (1setOf integer(1:MAX))	[this spec]	8
2328	imposition-template (type2 keyword name(MAX))	[this spec]	8
2329	insert-sheet (1setOf collection)	[this spec]	8
2330	insert-after-page-number (integer(0:MAX))	[this spec]	8
2331	insert-count (integer(0:MAX))	[this spec]	8
2332	media (type3 keyword name(MAX))	[this spec]	8
2333	media-col (collection)	[this spec]	8
2334	media (type3 keyword name(MAX))	[this spec]	8
2335	media-col (collection)	[this spec]	8
2336	media-back-coating (type3 keyword name(MAX))	[this spec]	8
2337	media-color (type3 keyword name(MAX))	[this spec]	8
2338	media-front-coating (type3 keyword name(MAX))	[this spec]	8
2339	media-hole-count (integer(0:MAX))	[this spec]	8
2340	media-info (text(255))	[this spec]	8
2341	media-key (type3 keyword name(MAX))	[this spec]	8
2342	media-order-count (integer(1:MAX))	[this spec]	8
2343	media-preprinted (type3 keyword name(MAX))	[this spec]	8
2344	media-recycled (type3 keyword name(MAX))	[this spec]	8
2345	media-size (collection)	[this spec]	8
2346	x-dimension (integer(0:MAX))	[this spec]	8
2347	y-dimension (integer(0:MAX))	[this spec]	8
2348	media-type (type3 keyword name(MAX))	[this spec]	8
2349	media-weight-metric (integer(0:MAX))	[this spec]	8
2350	media-input-tray-check (type3 keyword name(MAX))		
2351		[this spec]	8
2352	number-up (integer(1:MAX))	[this spec]	8
2353	orientation-requested (type2 enum)	[this spec]	8
2354	output-bin (type2 keyword name(MAX))	[this spec]	8
2355	page-delivery (type2 keyword)	[this spec]	8
2356	page-order-received (type2 keyword)	[this spec]	8
2357	page-overrides (1setOf collection)	[this spec]	8
2358	document-copies (1setOf rangeOfInteger(MAX))	[this spec]	8
2359	input-documents (1setOf rangeOfInteger(MAX))	[this spec]	8
2360	output-documents (1setOf rangeOfInteger(MAX))	[this spec]	8
2361	pages (1setOf rangeOfInteger(MAX))	[this spec]	8
2362	<any other Job Template attributes that affect pages,		
2363	such as media or media-col>		
2364	page-ranges (1setOf rangeOfInteger(1:MAX))	[this spec]	8
2365	pages-per-subset (1setOf integer(1:MAX))	[this spec]	8

2366	presentation-direction-number-up (type2 keyword)	[this spec]	8
2367	print-quality (type2 enum)	[this spec]	8
2368	printer-resolution (resolution)	[this spec]	8
2369	separator-sheets (collection)	[this spec]	8
2370	media (type3 keyword name(MAX))	[this spec]	8
2371	media-col (collection)	[this spec]	8
2372	separator-sheets-type (type3 keyword name(MAX))		
2373		[this spec]	8
2374	sheet-collate (type2 keyword)	[this spec]	8
2375	sides (type2 keyword)	[this spec]	8
2376	x-image-position (type2 keyword)	[this spec]	8
2377	x-image-shift (integer(MIN:MAX))	[this spec]	8
2378	x-side1-image-shift (integer(MIN:MAX))	[this spec]	8
2379	x-side2-image-shift (integer(MIN:MAX))	[this spec]	8
2380	y-image-position (type2 keyword)	[this spec]	8
2381	y-image-shift (integer(MIN:MAX))	[this spec]	8
2382	y-side1-image-shift (integer(MIN:MAX))	[this spec]	8
2383	y-side2-image-shift (integer(MIN:MAX))	[this spec]	8

2384
2385

2386 ~~Job Description attributes:~~
 2387 ~~job-mandatory-attributes (1setOf type2 keyword) [this spec] Error!~~
 2388 ~~Reference source not found.~~

2389
2390

2391 ~~Job Template attributes:~~
 2392 ~~ACTION (Tom) -- Need to add the JT and DT xxx-default and xxx-supported.~~
 2393 ~~job-copies (integer(1:MAX)) [this spec] Error!~~
 2394 ~~Reference source not found.~~
 2395 ~~job-cover-back (collection) [this spec] Error!~~
 2396 ~~Reference source not found.~~
 2397 ~~--<member attributes are the same as "cover-back">~~
 2398 ~~job-cover-front (collection) [this spec] Error!~~
 2399 ~~Reference source not found.~~
 2400 ~~--<member attributes are the same as "cover-front">~~
 2401 ~~job-finishings (1setOf type2 enum) [this spec] Error!~~
 2402 ~~Reference source not found.~~
 2403 ~~job-finishings-col (1setOf collection) [this spec] Error!~~
 2404 ~~Reference source not found.~~
 2405 ~~--<member attributes are the same as "finishings-col">~~
 2406 ~~media-size-name (type3 keyword | name(MAX)) [this spec] Error!~~
 2407 ~~Reference source not found.~~
 2408 ~~media-type (type3 keyword | name(MAX)) [this spec] Error!~~
 2409 ~~Reference source not found.~~

2410
2411

2412 Printer Description attributes:
 2413 document-creation-attributes-supported (1setOf type2 keyword)
 2414 [this spec] 10.1

2415
 2416 Operation attributes:
 2417 document-message (text(MAX)) [this spec]
 2418 9.1.18 ~~Error! Reference source not found.~~
 2419 ~~last-document (boolean) [this spec] Error!~~
 2420 ~~Reference source not found.~~

2421 17.2 Keyword attribute values

2422 ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values registered for
 2423 corresponding attributes.

2424 17.3 Enum Attribute Values

2425 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
 2426 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

Value	Name	Reference	Section:
-----	-----	-----	-----
document-state (type1 enum)		[this spec]	9.1.23
3 pending		[this spec]	9.1.23
5 processing		[this spec]	9.1.23
7 canceled		[this spec]	9.1.23
8 aborted		[this spec]	9.1.23
9 completed		[this spec]	9.1.23
job-finishings (1setOf type2 enum)		[this spec]	Error!
Reference source not found.			
<enum values are the same as "finishings">			
operations-supported (type2 enum)		[rfc2911]	4.4.15
0x0033 Cancel-Documents		[this spec]	4.5
0x0034 Get-Documents-Attributes		[this spec]	4.3
0x0035 Get-Documents		[this spec]	3.3
0x0036 Delete-Documents		[this spec]	5.4
0x0037 Set-Documents-Attributes		[this spec]	4.4
0x0039 Create-Documents		[this spec]	Error!
Reference source not found.			
0x003A Send-Data		[this spec]	Error!
Reference source not found.			

2452 **17.4 Operations**

2453 The following table lists all of the operations defined in this document. These are to be registered according to the
 2454 procedures in RFC 2911 [rfc2911] section 6.4.

2455	Operations	Reference	Section
2457	-----	-----	-----
2458	Cancel-Document	[this spec]	4.5
2459	Create-Document	[this spec]	Error!
2460	Reference source not found.		
2461	Delete-Document	[this spec]	5.4
2462	Get-Document-Attributes	[this spec]	4.3
2463	Get-Documents	[this spec]	3.3
2464	Send-Data	[this spec]	Error!
2465	Reference source not found.		
2466	Set-Document-Attributes	[this spec]	4.4
2467			

2468 **17.5 Attribute Group tags**

2469 The following table lists all the attribute group tags defined in this [documentspecification](#). These are to be registered
 2470 according to the procedures in RFC 2911 [rfc2911] section 6.5.

2471	Value	Name	Reference	Section
2472	-----	-----	-----	-----
2473	0x09	document-attributes-tag	[this spec]	12
2474				

2475 **17.6 Status codes**

2476 [The following table lists all the status codes defined in this specification. These are to be registered according to the](#)
 2477 [procedures in RFC 2911 \[rfc2911\] section 6.6.](#)

2478	Value	Status Code Name	Reference	Section
2479	-----	-----	-----	-----
2480	<u>0x0500:0x05FF - Server Error:</u>			
2481	0x050B	server-error-too-many-jobs	[this spec]	
2482	0x050C	server-error-too-many-documents	[this spec]	

2483 **18 Internationalization Considerations**

2484 The internationalization considerations for this extension for handling the Document object are the same as for
 2485 handling the Job object in [rfc2911].

2486 19 Security Considerations

2487 The Document object should provide no more increased security considerations than the Job object. The Printer
2488 MUST provide the same access control for Document objects as for Job objects.

2489 ~~As with the Create-Job operation is [rfc2911], t~~The Printer implementer needs to consider counter measures for
2490 denial of service attacks for the ~~Create-Document~~Create-Job operation. For example, a rogue client could issue
2491 repeated ~~Create-Document~~Job and/or ~~Send-Document/Send-URI~~ requests in an attempt to exceed the capacity of
2492 the Printer to absorb such requests and thereby deny Job Creation and Document Creation requests from other
2493 clients. For example, avoid a fixed set of allocations for Jobs and Documents. Also be able to detect when an
2494 excessive number of Create-Job and ~~Create-Document~~Send-Document/Send-URI requests have been supplied. In
2495 such a case, the Printer would return either a 'server-error-~~service-unavailable~~too-many-jobs' status code (see
2496 ~~[rfc2911]~~ section 13.1~~13.1.5.3~~) or a 'server-error-~~temporary-error~~too-many-documents' status code (see section
2497 13.2~~[rfc2911]~~13.1.5.6).

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2525 23 Appendix A: Document operations compared to Job operations

2526 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2527 ~~Table 17~~ compares the Job and Document operations. The two Conf. columns indicate the conformance
 2528 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A “REQ”
 2529 in the Document Conformance column means if the Document object is supported. Whether a Document operation
 2530 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
 2531 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
 2532 based protocols, APIs, and implementations.

2533 **Table 17 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
Cancel-Current-Job	OPT	<i>N/A, can only cancel a document explicitly by document number and explicit job id.</i>	OPT
Cancel-Job	REQ	Cancel-Document	REQ
Create-Job	OPT	Create-Document	OPT
Get-Job-Attributes	REQ	Get-Document-Attributes	REQ
Get-Jobs	REQ	Get-Documents	REQ
Hold-Job		<i>N/A, can only hold an entire job.</i>	
Print-Job	REQ	Send-Document (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.1)	OPT
Print-URI	OPT	Send-URI (existing operation - see [rfc2911] with an additional Document attributes group defined in section 4.2)	OPT
N/A		Send-Data	REQ
Promote-Job	OPT	<i>N/A, can only promote an entire job</i>	
Purge-Jobs	OPT	Delete-Document	OPT
Release-Held-New-Jobs	OPT	<i>N/A, can only release entire jobs</i>	
Release-Job	OPT	<i>N/A, can only release an entire job</i>	
Reprocess-Job	OPT	<i>N/A, can only reprocess an entire job</i>	
Restart-Job	OPT	<i>N/A, can only restart an entire job</i>	
Resume-Job	OPT	<i>N/A, can only resume an entire job</i>	
Schedule-Job-After	OPT	<i>N/A, can only schedule an entire job</i>	
Set-Job-Attributes	OPT	Set-Document-Attributes	OPT
Suspend-Current-Job	OPT	<i>N/A, can only suspend an entire job in order to run another one</i>	
Validate-Job	REQ	<i>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 each document in a multi-document job.</i>	REQ

2534
2535

2536 **24 Annex B: Change Log (informative)**

2537 The following summaries of the changes in chronological order:

2538 Version 0.3, 9 September 2002:

- 2539 1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
- 2540 2. Added “original-requesting-user-name” Operation attribute to ~~Table 8~~ **Table 8**.
- 2541 3. Added “y” to “output-bin” in ~~Table 10~~ **Table 10** so it MAY be a Document Template attribute.
- 2542 4. Clarified the * and in ~~Table 11 - Job and Document Description attributes~~ **Table 11 - Job and Document Description attributes**.
- 2543 5. Added section 9.1.1 all of the Printer attributes defined In any IPP standard.
- 2544 6. Allocated operation-id enums in section 11 to the 7 Document operations.
- 2545

- 2546 7. Added the conformance section 14
2547 8. Completed the IANA Considerations section 0.

2548

2549 Version 0.4, 14 October 2002:

- 2550 1. Added the operation specifications.
2551 2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
2552 3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
2553 4. Added the Attribute Precedence section 6.
2554 5. Added [ippsave] attributes.
2555 6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
2556 document-id-uri, and redirect-uri.

2557

2558 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:

- 2559 1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
2560 the PWG Last Call to progress as a Draft Standard.
2561 2. Changed Cancel-Document from OPTIONAL to REQUIRED.
2562 3. Added ~~Table 4~~ [Table 4](#) and ~~Table 5~~ [Table 5](#) to show the request and response signatures of the Document
2563 Creation and Validation operations.
2564 4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4]
2565 and because the Document object is really the Input Document (as opposed to the Output Document). The
2566 Printer copies this value to the Document's "document-number" Document Description attribute.
2567 5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
2568 6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
2569 7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the
2570 "document-message" agreement (see point #15).
2571 8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in
2572 Group 4.
2573 9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
2574 attribute in a Document Creation response.
2575 10. Added the "document-mandatory-attributes" Operation attribute.
2576 11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
2577 Attributes and the other Document attributes.
2578 12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
2579 13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.
2580 14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
2581 and "document-id-uri" to be parallel with the Get-Jobs operation.
2582 15. Changed the "message" Operation attribute in Cancel-Document and Cancel-Current-Document to
2583 "document-message" Operation attribute which the Printer copies to the "document-message" Document
2584 Description attribute for use both by the user and the operator.
2585 16. Clarified that the "document-state-reasons" values never affect Job scheduling.
2586 17. Made Job Level - page override programming higher precedence than Document level Document object
2587 attributes.
2588 18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
2589 requested".
2590 19. In ~~Table 8~~ [Table 8](#), flagged the Operation attributes that the Printer copies to the corresponding Job and
2591 Document Description attributes in Document Creations operations.
2592 20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have
2593 "document-mandatory-attributes" Operation attribute.
2594 21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
2595 with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
2596 22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages
2597 across Input-Documents.
2598 23. Disallowed "page-ranges" at the Page Level.
2599 24. Disallowed "pages-per-subset" at the Document level (and Page Level).
2600 25. Disallowed "separator-sheets" at the Page Level.

2601 26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Documents-
 2602 Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-
 2603 Jobs and Get-Job-Attributes.
 2604

2605 Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:

- 2606 1. Deleted the Cancel-Current-Documents and Validate-Documents operations.
- 2607 2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.
- 2608 3. Deleted the "document-mandatory-attributes" Operation attribute to align with the PWG Semantic model. So
 2609 both specifications have only the "job-mandatory-attributes" Operation attribute. The client can only supply
 2610 at the Job Level. The Document Level inherits from the Job Level.
- 2611 4. Increased "document-message" Operation attribute length from 127 to MAX (1023) octets.
- 2612 5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the
 2613 Document level inherits their values.
- 2614 6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
- 2615 7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute
 2616 as used by UPnPv1 and UPnPv2.
- 2617 8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and
 2618 UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template
 2619 attributes).
- 2620 9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
- 2621 10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
- 2622 11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
- 2623 12. Added the following Document Description attributes: "document-format-detail", "document-format-detected",
 2624 "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
- 2625 13. Defined all of the Document Description attributes, often with references to other specifications, so that they
 2626 appear in the table of contents.
 2627

2628 Version 0.7, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:

- 2629 1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
- 2630 2. Updated the Abstract and Introduction to reflect the additions.
- 2631 3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
- 2632 4. Deprecated the "input-document-number" Operation attribute ([pwg5100.4] section 9.2.1 in the Create-
 2633 Document Requests
- 2634 5. Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.
- 2635 6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using "last-
 2636 document" still works too and the Printer MUST support both ways.
- 2637 7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation
 2638 operation to the Document object as observable in Document object query responses. Document objects
 2639 inherit that effect from the Job object.
- 2640 8. Added the following operation and Document Description attributes: document-container-summary
 2641 (collection), document-creator-application-name (name(MAX)), document-creator-application-version
 2642 (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-
 2643 format-device-id (text(127)), document-format-version (text(127)). The "document-container-summary"
 2644 collection attribute may contain them, plus "document-format" and "document-natural-language".
- 2645 9. REQUIRED Printers to support "document-format-version" Document Description.
- 2646 10. Deprecated "document-overrides" and indicated that the agreement is to re-issue [pwg5100.4] without
 2647 "document-overrides".
- 2648 11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with
 2649 "document-" so that no Document attribute has a "job-" prefix: "job-printer-uri" becomes "document-job-
 2650 printer-uri", "job-uri" becomes "document-job-uri", and "job-id" becomes "document-job-id".
- 2651 12. Added the encoding for the "document-attributes-tag" as 0x09.
- 2652 13. Updated the IANA Registration section, but still needs more work.
 2653

2654 Version 0.8, 24 March 2003, agreements from the March 20 telecon:

- 2655 1. Changed the name of the Send-Document-Data back to Send-Data to keep the name short. There wasn't
 2656 support for keeping the name of the object affected in the name of the operation.
 2657 2. Changed "job-mandatory-attributes" operation/Job Description attribute so that a Printer MUST support it.
 2658 3. Changed the name of the collection attribute back to "document-format-details".
 2659 4. Removed the Operation attributes and Document Description attributes that were already in the member
 2660 attributes of "document-format-details", so that any details must use the "document-format-details" (1setOf
 2661 collection).
 2662 5. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using
 2663 "pages-per-subset" and "page-overrides".
 2664 6. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as
 2665 an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward
 2666 compatibility.
 2667 7. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if
 2668 present.
 2669 8. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first
 2670 collection value.
 2671 9. Added "document-format-details-detected (1setOf collection) Document Description attribute.
 2672 10. Clarified that "document-natural-language" identifies the primary or first language if a Document contains
 2673 more than one language.
 2674 11. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
 2675 12. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
 2676 13. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords)
 2677 Printer Description attribute.
 2678

2679 Version 0.9, 7 April 2003, agreements from the April 3 telecon:

- 2680 1. Added "document-charset" (charset), "document-digital-signature" (type2 keyword), "document-format-
 2681 version" (text(127)), and "document-natural-language" (naturalLanguage) Operation and Document
 2682 Description attributes and corresponding "xxx-default" and "xxx-supported" Printer Description attributes.
 2683 2. Changed the "document-natural-language" member attribute of "document-format-details" (1setOf collection)
 2684 operation attribute to be 1setOf, but kept the top level "document-natural-language" Operation attribute as
 2685 single-valued.
 2686 3. Added Summary [Table 2Table-2](#) of new Operation/Document Description attributes.
 2687 4. Defined CONDITIONALLY REQUIRED and CMUST Conformance Terms.
 2688 5. Deleted the "document-id-uri" Operation attribute no longer needed by PSI.
 2689 6. Changed "ipp-attribute-fidelity" so it doesn't affect operation attributes, so it is the same as in [rfc2911].
 2690 7. Clarified the operation attributes supplied at the Job Level in Print-Job and Print-URI versus Create-Job by
 2691 introducing the "p" notation in [Table 8Table-8](#).
 2692 8. Added columns to [Table 8Table-8](#) to show the corresponding Document Description attributes and the "xxx-
 2693 default" and "xxx-supported" Printer Description attributes.
 2694 9. Clarified that all of the new Operation attributes are hints, except "document-charset" and "document-format"
 2695 and that the client can turn them into Must Honor by supplying their keyword attribute names in the "job-
 2696 mandatory-attributes Operation attribute.
 2697 10. Add the unique lang prefix from the Printer MIB to all "document-format-version" values, so that they can all
 2698 be in a single flat list for the Printer's "document-format-version-supported" Printer Description attribute.
 2699

2700 Version 0.10, May 1, 2003, agreements from the May 1 telecon:

- 2701 1. Removed the conformance language from the Abstract.
 2702 2. Clarified that the "job-mandatory-attributes" can include keywords that the Printer doesn't support. The
 2703 rejection occurs only if the client actually supplies the unsupported Template attribute in a request.
 2704 3. Clarified that a Print-Job is indistinguishable to Create-Job and one Send-Document.
 2705 4. Added that the Printer MUST reject a redundant Close-Job.
 2706 5. Clarified that the Printer MUST validate Create-Document in the context of the Job as a whole, including
 2707 previous Documents in the same Job.
 2708 6. Split [Table 7Table-7](#) of Operation Attributes into two. Show the syntaxes for the "xxx-default" and "xxx-
 2709 supported" attributes in the first table.

- 2710 7. Split the Print-Job/Print-URI from the Create-Job into two columns.
- 2711 8. Added "output-device-requested" Operation attribute.
- 2712 9. Added the Printer options (reject, hold, ignore) when the client supplies unsupported values in the Operation
- 2713 attributes for all but "compression", "document-charset", "document-format".
- 2714 10. Use the 'application/vnd.PWG-XXX' for unregistered Printer MIB printer languages.
- 2715 11. Added "output-device-requested (name(127) Operation/Job Description attribute for Job Creation operations.
- 2716 12. Added "document-format-target" (mimeType) and "document-format-version-target" (text(127) Job
- 2717 Template and Document Template attributes.
- 2718 13. Clarified that a Document Template attribute share the "xxx-default" and "xxx-supported" Printer attribute
- 2719 values with the Job Template attribute of the same name.
- 2720 14. Added that Document Template attributes MAY have corresponding "xxx-actual" Document Description
- 2721 attributes.
- 2722 15. Added "document-format-version-detected" Document Description attribute.
- 2723 16. Added 'digital-signature-did-not-verify', and 'digital-signature-type-not-supported', and [job-]errors-detected' to
- 2724 "job-state-reasons" and "document-state-reasons".
- 2725 17. Added 'job-digital-signature-wait' to "job-state-reasons".
- 2726
- 2727 Version 0.11, May 9, 2003, agreements from the May 1 telecon:
- 2728 18.1 Split the document up into 3 separate documents.
- 2729 a. The Document Object extension to IPP
- 2730 b. Job and Document extensions to IPP from IPPFAX, PSI and others
- 2731 c. Future extensions
- 2732 2. Added 'server-error-too-many-jobs' and 'server-error-too-many-documents' status codes.
- 2733 3. Removed Create-Document and Send-Data operations.
- 2734 4. Removed Job State and job-state-reasons info
- 2735