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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
document overrides of Job Template attributes.

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This specification defines new operations or extends RFC2911 operations as follows:

1 RFC 2911 operation that creates a Job object: Create-Job

2 RFC 2911 operations that create a Job and Document object: PrintJob, Print-URI

2 RFC 2911 operations that create Document objects: Send-Document, Send-URI

5 new operations: Get-Documents, Get-Document-Attributes, Set-Document-Attributes, Cancel-Document,
Delete-Document

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

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



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



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Working Draft, June 3, 2003

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-ippdoc20030530.pdf, .doc, .rtf

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110 2) leave the subject line blank

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

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113 end

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

119

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279

280 1 Introduction and Summary

281 This IPP specification extends the IPP Model and Semantics [rfc2911] object model by defining a Document object.
 282 The [rfc2911] Job object is extended to contain one or more Document objects that are passive objects operated on
 283 by the Job. The REQUIRED Print-Job and OPTIONAL Print-URI operations ([rfc2911] sections 3.2.1 and 3.2.2)
 284 create a Job object containing a single Document object. The REQUIRED Create-Job operation ([rfc2911] section
 285 3.2.4) creates a Job object. The REQUIRED Send-Document and OPTIONAL Send-URI operations ([rfc2911]
 286 section 3.3.1 and 3.3.2) add a Document object to the specified Job object. This specification adds a Document
 287 Attributes group (and tag) to the Send-Document and Send-URI requests and responses. The Document Attributes
 288 group contains any Document Template attributes to be applied to this Document object being created, overriding
 289 any corresponding Job Template attribute supplied at the job level (by Create-Job) and thereby allowing the client to
 290 vary the Document Template attributes between Document objects in a single Job.

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

- 293 1 REQUIRED Job operation: Get-Documents
- 294 1 REQUIRED Job and Document Creation operation: PrintJob [rfc2911]
- 295 1 OPTIONAL Job and Document Creation operation: Print-URI [rfc2911]
- 296 1 REQUIRED Document Creation operation: Send-Document [rfc2911]
- 297 OPTIONAL Document creation operation: Send-URI [rfc2911]
- 298 2 REQUIRED Document operations: Cancel-Document, Get-Document-Attributes
- 299 2 OPTIONAL Document operations: Delete-Document, Set-Document-Attributes.

300 This specification uses the new Operation attributes (defined in [jobx]) that describe the contents of the Document
 301 and permit the Printer to reject requests that it cannot process correctly to define new Document Description
 302 attributes. The Printer copies these Operation attributes to the corresponding Document Description attributes which
 303 client may query.

304 This specification also uses existing Job Template attributes to define Document Template attributes (“xxx”
 305 Document attribute, “xxx-actual” Document Description [ippact], “xxx-default” Printer attribute, and “xxx-supported”
 306 Printer attribute. In addition this specification lists all of the attributes defined in other IPP specifications¹ to show
 307 their relationship to corresponding attributes defined in this IPP specification for use with the Document object. The
 308 analogous Document Descriptions attributes that correspond to the Job Description attributes are also defined.

309 The semantics of “document-state”, “document-state-reasons”, and “document-state-message” Document
 310 Description attributes are based on the corresponding [rfc2911] “job-state”, “job-state-reasons”, and “job-state-
 311 message” Job Description attributes. The state transitions for a Document are simpler than a Job’s. Documents wait
 312 for the Job to process it, are processed by the Job or have reached its terminating state. Only the applicable state
 313 values are used. It is assumed that an implementation will only use values from “job-state-reasons” that are
 314 applicable to a Document for “document-state-reasons”.

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

319 1.1 Scope

320 Part of the extension is to allow the client to supply printing instructions, called Document Template attributes, when
 321 creating each Document object. An IPP Printer implementation MAY support most of the existing Job Template

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.

322 attributes as Document Template attributes as well. (The PWG Semantic Model [pwg-sm] currently calls the Job
 323 Template attributes and Document Template attributes simply “Job Processing” and “Document Processing”
 324 attributes). Note: There are a number of footnotes that relate this IPP specification to the PWG Semantic model and
 325 other PWG projects, such as the Print Service Interface (PSI) [pwg-psi].

326 The Document object is a passive object² and is operated upon by the Job. The client uses either of the existing
 327 Send-Document and Send-URI operations to create a Document object. In addition there are 8 new operations that
 328 affect the Document object after it has been created as summarized in Table 1.

329 **Table 1 - Summary of operations**

Operation Name	Printer support	Brief Description
Print-Job [rfc2911]	REQUIRED	Creates a Job object as in [rfc2911] that contains a single Document object with pushed data in-line. Some additional Operation attributes are defined in [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] for use in creating the Document object with Document Description attributes.
Create-Job [rfc2911]	REQUIRED ³	Creates the Job object as defined in [rfc2911] with Job Attributes. The Document objects that are subsequently created for the Job using Send-Document and/or Send-URI inherit Job Template attributes that affect individual documents, such as “media”.
Send-Document [rfc2911]	REQUIRED ³	Creates a Document object with Document attributes and data. Some additional Operation attributes are defined in [jobx] 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] for use in creating the Document object with Document Description attributes, along with a new Document attributes group to pass Document Template attributes.
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.

330 This specification uses existing [rfc2911] and [jobx]Operation attributes summarized in Table 2 to define new
 331 Document Description attributes. The Printer copies these Operation attributes supplied by the client in the request
 332 to the corresponding Job or Document Description attributes.
 333

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.

334

Table 2 - Summary of Operation and New Description attributes

Operation attribute	Creation operation	Printer support	Description
ipp-attribute-fidelity (boolean) * [rfc2911] §15.1	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) [Jobx] § 4.1.2	Job	MUST	Allows the client to list which Job Template and Document Template attributes that the Printer MUST support.
document-charset (charset) [Jobx] § 4.2.1	Document	CMUST ⁴	The charset of the Document Object content
document-digital-signature (type2 keyword) [Jobx] § 4.2.2	Document	MAY	The type of digital signature, if any used in the Document Object content.
document-format (mimeType) * [rfc2911] §3.2.1.1	Document	MUST	The document format of the Document Object content
document-format-details (1setOf collection) [Jobx] § 4.2.4	Document	CMUST ⁵	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)) [jobx] § 4.2.5	Document	MAY	The level or version of the document format.
document-natural-language (naturalLanguage) * [rfc2911] §3.2.1.1	Document	MAY	The primary language of the Document Object content.

335 * - Indicates Operation attributes defined in [rfc2911] that are extended to apply to the Document Creation operations
 336 defined in this specification.

337 2 Terminology

338 This section defines terminology used throughout this document.

339 2.1 Conformance Terminology

340 Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, and **OPTIONAL**, have
 341 special meaning relating to conformance as defined in RFC 2119 [rfc2119]. If an implementation supports the
 342 extension defined in this document, then these terms apply; otherwise, they do not. These terms define
 343 conformance to *this document (and [rfc2911]) only*; they do not affect conformance to other documents, unless
 344 explicitly stated otherwise. For example, the term **REQUIRED** in this document means “**REQUIRED** if this
 345 **OPTIONAL** Document Object specification is implemented”.

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

⁴ 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 [jobx] §3.2.1).

⁵ 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’

348 2.2 Other Terminology

349 This document uses the same terminology as [rfc2911], such as “**client**”, “**Printer**”⁶, “**attribute**”, “**attribute value**”,
 350 “**keyword**”, “**Job Template attribute**”, “**Operation attribute**”, “**operation**”, “**request**”, “**response**”, and “**support**”
 351 with the same meaning. In addition, the following terms are defined for use in this document:

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

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

358 **Document Creation operation** - operations that create Document objects. Specifically: Print-Job, Print-URI, Send-
 359 Document, and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and **Document Creation**
 360 operations, since they create both Job and a **Document object** at the same time. Also this specification does not
 361 extend the Print-Job and Print-URI operations. However, this specification does extend the Send-Document and
 362 Send-URI operations to allow the client to supply **Document Template** attributes in each request.

363 **Document Level** - Operation and Document Template attributes supplied in the Send-Document and Send-URI
 364 operations are referred to as being supplied at the **Document Level**. Note: attribute supplied in the Print-Job and
 365 Print-URI requests are considered as being supplied at the **Job Level** only, *not* also at the **Document Level**, even
 366 though Print-Job and Print-URI also create **Document objects** (see Table 3).

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

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

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

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

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

379 **Job Level - Operation** and **Job Template** attributes supplied in the Print-Job, Print-URI, and Create-Job are
 380 referred to as being supplied at the **Job Level** (see Table 3). Attributes supplied at the **Job Level** are a mixture of
 381 **Job attributes** and **Document attributes**. **Job Template attributes** apply to the Job as a whole, while **Document**
 382 **Template attributes** provide defaults for the **Document objects** in case the client does not supply a **Document**
 383 **Template attribute** at the **Document Level** for a **Document object**. Put another way, **Document objects** *inherit*
 384 **Document Template attributes** from the **Job object** that are used if the client didn't supply a corresponding
 385 **Document Template** attribute for the **Document object**.

⁶ [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].

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

390 Table 3 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job
 391 Creation operations and Document Creation operations, though they only create single Document jobs. In other
 392 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
 393 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a
 394 separate Document group in which the client can supply Document attributes. Note also that for the "Level" concept,
 395 no operation supplies attributes at more than one level.⁷

396 **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		
					Document Level
Send-Document		yes		Document attributes	
Send-URI		yes		Document attributes	

397

398 **3 New Job operations and semantic extensions to Job operations**

399 This section defines the semantic extensions to Job operations that affect Document objects. Printer and
 400 Subscription object (Event Notification [ntfy]) operations MUST have no effect on the Document object and the
 401 Document object has no effect on the semantics of the Printer and Subscription operations. The Job operations that
 402 MUST NOT have any effect on the Document object because they are defined to affect the Job object as a whole

⁷ 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).

403 are: **Get-Job-Attributes**⁸ ([rfc2911] section 3.3.4), **Get-Jobs**⁹ ([rfc2911] section 3.2.6), **Hold-Job** ([rfc2911] section
404 3.3.5), **Release-Job** ([rfc2911] section 3.3.6), **Set-Job-Attributes** ([rfc3380] section 4.2), and **Validate-Job**
405 ([rfc2911] section 3.2.3).

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

408 **3.1 Job Creation operations**

409 This section defines the extensions to the Job Creation operations.

410 **3.1.1 Operation Attributes**

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

413 **3.1.1.1 ipp-attribute-fidelity (boolean) ([rfc2911] section 3.2.1 and 15)**

414 This REQUIRED Operation attribute specifies the policy for the Printer to use (see [rfc2911] §3.2.1.1)_when the
415 client supplies unsupported Job Template or Document Template attributes¹⁰ or value in a Job Creation operation or
416 a subsequent Document Creation operation for this job. The value 'true' indicates that total fidelity to client supplied
417 Job Template and Document Template attributes and values is required for this Job Creation operation and all
418 subsequent Document Creation operations for this job. If the client supplies the value 'false' or omits the attribute,
419 then the Printer MUST accept the Job Creation operation and all subsequent Document Creation operations even if
420 the client supplies unsupported attributes or values in them.

421 The Printer MUST copy this attribute to the corresponding Job Description attribute (see [jobx] section 6.1) and use
422 its value for validating subsequent Document Creation operations for this job.

423 Note: The inheritance of the effect of the "ipp-attribute-fidelity" Operation attribute by subsequent Document Creation
424 operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting the
425 behavior of the Document Level (see Table 3).

426 **3.1.1.2 job-mandatory-attributes (1setOf type2 keyword) Operation attribute**

427 This REQUIRED¹¹ Operation attribute identifies which Job Template and Document Template attributes the Printer
428 MUST Honor in this Job Creation request and all subsequent Document Creation requests for this Job.

429 A client MUST NOT supply this "job-mandatory-attributes" Operation attribute in a Document Creation operation. If a
430 client does supply this attribute in a Document Creation operation, the Printer MUST ignore and otherwise accept the
431 request and return this attribute without any values in the Unsupported Attributes Group in the response (see

⁸ 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.

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 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.

¹¹ 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.

432 [rfc2911] section 3.1.7). Thus the Printer only supports the “job-mandatory-attributes” Operation attribute supplied at
433 the Job level. Thus the “job-mandatory-attributes” Operation attribute controls all other Job Template and Document
434 Template attributes supplied at the Job Level and Document Level uniformly. Note: The inheritance of the effect of
435 “job-mandatory-attributes” Operation attribute supplied at the Job Level by subsequent Document Creation
436 operations is like the inheritance of Job Template attributes.

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

440 Note: The inheritance of the effect of the “job-mandatory-attributes” Operation attribute by subsequent Document
441 Creation operations is like the inheritance of Document Template attributes supplied at the Job Level but affecting
442 the behavior of the Document Level (see Table 3).

443 **3.1.2 Create-Job ([rfc2911] section 3.2.4)**

444 This REQUIRED¹² operation creates the Job object with all of the mixture of Job and Document attributes supplied in
445 the Create-Job operation. All Operation attributes supplied affect the Job as a whole. The client supplies Job
446 Template attributes [rfc2911] that are a mixture of Job and Document attributes supplied together in the Job attribute
447 group in the request¹³. For example, such Job Template attributes as “job-priority” and “job-hold-until” are Job
448 attributes that affect the Job as a whole. On the other hand, such Job Template attributes as “media” and “number-
449 up” are Document attributes that the client is supplying as defaults for the Document objects. The Document objects
450 that are subsequently created for the specified Job are said to inherit the Document attributes from the Job object,
451 unless the Document Creation operation supplies a corresponding Document Template attribute. However, the
452 Printer MUST NOT copy down any Job Level attributes to the Document object as observable by a client in any Get-
453 Documents or Get-Document-Attributes operation responses.

454 **3.1.3 Print-Job ([rfc2911] section 3.2.1)**

455 This REQUIRED operation creates one Document object as a side effect of the Print-Job operation in addition to
456 creating the Job object. The Printer MUST copy all of the supported Operation attributes supplied by the client to the
457 corresponding Job Description or Document Description attributes as indicated in Table 8. For example, the Printer
458 copies the “job-name” and “attributes-charset” operation attributes to the corresponding Job Description attributes,
459 while copying the “document-format” and “document-charset” Operation attributes to the corresponding Document
460 Description attributes. The Printer MUST copy the supported Job Template attributes supplied by the client to the
461 Job object and MUST NOT copy them down to the Document object. In other words, the Document object created
462 by Print-Job has an empty group of Document (and Job) Template attributes. Any Job Template attributes supplied
463 that affect Documents have effect on the Document object because the Document object inherits them from the Job
464 object.

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

¹² In [rfc2911] the Create-Job operation is OPTIONAL for a Printer to support.

¹³ 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.

471 Note: Using the Get-Job-Attributes and Get-Document-Attributes, a Job created by Print-Job will be indistinguishable
472 to a client from a Job created with Create-Job and Send-Document with no Document Template attributes supplied.
473 Also an old client performing just a Get-Job-Attributes will see the same results from (1) an old Printer that accepted
474 the Print-Job, (2) a new Printer that accepted the Print-Job, and (3) a new Printer that accepted the Create-Job and
475 Send-Document (with no Document Template attributes supplied). However, if a new client supplies Document
476 Template attributes on the Send-Document, instead of the same attributes as Job Template attributes on the Create-
477 Job, then an old client will not see any of the Document Template attributes when it performs the Get-Job-Attributes
478 operation (since the Printer does not "copy up" Document Template attributes to the Job Level on a Get-Job-
479 Attributes on a one document job

480 **3.1.4 Print-URI ([rfc2911] section 3.2.2)**

481 This OPTIONAL operation creates one Document object as a side effect of the Print-URI operation in creating the
482 Document object with Document Description attributes. The Printer MUST copy all of the supported Operation
483 attributes supplied by the client and the Job Template attributes as indicated for Print-Job in section 3.1.3. In addition
484 the Printer MUST copy the "document-uri" Operation attribute to the corresponding Document Description attribute.

485 Note: Using the Get-Job-Attributes and Get-Document-Attributes, a Job created by Print-URI will be
486 indistinguishable to a client from a Job created with Create-Job, Send-URI with no Document Template attributes
487 supplied.

488 **3.2 Validate-Job ([rfc2911] section 3.2.4)**

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

496 (1) Perform all of the Validate-Job operations for each of the documents before doing the Create-Job in order
497 to validate all documents before creating the Job and transmitting any document data OR

498 (2) Perform a Create-Job and then a Validate-Job before each Send-Document (or Send-URI) operation.

499 There are certain configurations and implementations where the above validation will not completely validate a multi-
500 document job with differing Document Template attributes for the same Job. Consider a Printer that is representing
501 several dissimilar devices in which no device is a superset of the others. In such as case, the Printer MAY reject a
502 Send-Document operation that cannot be supported in the Job because the combination of its supplied Document
503 Template attributes cannot be supported in the same Job in combination with the differing Document Template
504 attributes of the previously supplied documents. In such a case, there is no way to completely validate a multi-
505 document job which has documents with differing Document Template attributes using Validate-Job, since each
506 Validate-Job is a separate independent operation. An administrator can avoid such a configuration by making sure
507 that one of the devices is a superset of all of the other devices.

508 **3.3 Get-Documents Operation**

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

512 This operation is similar to the Get-Document-Attributes operation (see section 4.3), except that this Get-Documents
513 operation returns attributes from all Document objects contained in the Job object, instead of from a single selected
514 Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return
515 attributes that were submitted by a client when the Document object was created by the Send-Document or Send-
516 URI operations and possibly modified by the Set-Document-Attributes operation (see section 4.4).

517 3.3.1 Get-Documents Request

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

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

522 Group 1: Operation Attributes

523 Natural Language and Character Set:

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

525 Target:

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

528 Requesting User Name:

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

531 3.3.1.1 "limit" (integer(1:MAX)):

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

538 3.3.1.2 "requested-attributes" (1setOf type2 keyword):

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

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

545 'document-number' (see section 9.1.21)

546

547 3.3.2 Get-Documents Response

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

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

553 **Group 1: Operation Attributes**

554 **Status Message:**

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

558 **Natural Language and Character Set:**

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

560 **Group 2: Unsupported Attributes**

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

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

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

568 The Printer responds with one set of Document Template attributes (see the D column in Table 10) and
569 Document Description attributes (see the Doc column in Table 11) for each returned Document object as
570 specified by the "requested-attributes" Operation attribute supplied by the client in the request. The Printer
571 ignores (does not respond with) any requested attribute or value which is not supported or which is restricted
572 by the security policy in force, including whether the requesting user is the user that submitted the job (job
573 originating user) or not (see [rfc2911] section 8). However, the Printer MUST respond with the 'unknown'
574 value for any supported attribute (including all REQUIRED attributes) for which the Printer does not know the
575 value, unless it would violate the security policy. See the description of the "out-of-band" values in the
576 beginning of [rfc2911] section 4.1.

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

579 **3.4 Cancel-Job ([rfc2911] section 3.3.3)**

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

583 **3.5 Send-Document ([rfc2911] section 3.3.1)**

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

587 **3.6 Send-URI** ([rfc2911] section 3.3.2)

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

591 **3.7 Hold-Job** ([rfc2911] section 3.3.5)

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

595 **3.8 Release-Job** ([rfc2911] section 3.3.6)

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

599 **3.9 Restart-Job** ([rfc2911] section 3.3.7)

600 This OPTIONAL operation starts the Job over again by processing *all* Documents in the Job as described in [rfc2911]
601 section 3.3.7, including Documents that have been canceled by a previous Cancel-Document operation (see section
602 4.5). Therefore, the Printer removes any 'canceled-by-xxx' values from any of the "document-state-reasons"
603 attributes and the Job's "job-state-reasons" attributes so that any canceled Documents are reprocessed along with
604 the other Documents.

605 **3.10 Reprocess-Job** ([adm-ops] section 4.1)

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

610 **4 Document Operations**

611 This section defines the Document Creation and Document operations. The Document object semantics are as
612 parallel to the Job object semantics as possible. Therefore, most of the Job operations have analogous Document
613 operations as shown in Table 16 in section "Appendix A: Document operations compared to Job operations".
614 Operations that can apply only to an entire job, have no analogous document operation as indicated. This extension
615 adds 5 new Document operations that operate on the Document object once it is created by either of the existing two
616 operations: Send-Document and Send-URI operations.

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

619 The signatures of the operation requests that create Document objects are very similar as shown in Table 4. The
620 entries in the table show what a client MUST, MAY, or MUST NOT supply in the indicated operation requests.

621

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

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

622

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

624

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

625

626 **4.1 Send-Document ([rfc2911] section 3.3.1) extension**

627 This REQUIRED¹⁴ Document Creation operation allows a client to submit multiple documents in a single Job by
 628 making a Send-Document request for each Document. In this specification, the Send-Document creates a
 629 Document object ([rfc2911] did not have a Document object). A Printer MUST support this operation with the
 630 semantics specified in [rfc2911] and with the extension defined in this specification, since this specification
 631 REQUIRES the Printer to support multiple document jobs.

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

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

637 **4.1.1 Send-Document Request**

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

¹⁴ 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.

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

640 As specified in [rfc2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 8.
641 For example, "compression", "document-format", and "document-name".

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

643 The client OPTIONALLY supplies a set of Document Template attributes as listed in Table 10. For example,
644 "media" and "number-up". If the client is not supplying any Document Template attributes in the request, the
645 client SHOULD omit Group 2 rather than sending an empty group. However, a Printer MUST be able to
646 accept an empty group.

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

648 The client MUST supply the document data in-line to be processed for this Document if the "last-document"
649 flag is set to 'false' or omitted. However, since a client might not know that the previous Document Creation
650 operation that the client had supplied (a Send-Document or a Send-URI operation) was the last document
651 (i.e., the client had supplied the "last-document" attribute with a 'false' value), the client MUST use a Send-
652 Document request with no document data where the "last-document" flag is set to 'true' (see [rfc2911]
653 section 3.3.1). For this Send-Document case with no data, the Printer MUST NOT increment the value of the
654 Job object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it
655 is not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and
656 Send-Document request with a "last-document" Operation attribute set to 'true' with no document data; it is
657 only an empty job which is scheduled and processed normally.

658 4.1.2 Send-Document Response

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

660 Group 1: Operation Attributes (as in [rfc2911] Group 1)**661 Status Message:**

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

665 Natural Language and Character Set:

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

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

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

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

670 The Printer MUST return the same set of Job status attributes as for the Print-Job response as specified in
671 [rfc2911] section 3.2.1.2.

672 Group 4: Document Object Attributes (new)

673 The following Document Description attributes are defined for this Group:

674 **4.1.2.1 document-number (integer(1:MAX))**

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

677 **4.1.2.2 document-state (type1 enum)**

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

679 **4.1.2.3 document-state-reasons (1setOf type2 keyword)**

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

681 **4.1.2.4 document-state-message (text(MAX))**

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

684 **4.2 Send-URI ([rfc2911] section 3.3.2) extension**

685 This OPTIONAL Document Creation operation has the same request and response semantics as the Send-
686 Document operation (see section 4.1) except that a client MUST supply a URI reference ("document-uri" Operation
687 attribute) rather than the document data itself. If a Printer supports this operation, clients can use either this
688 operation or the Send-Document operation to add new Document objects to an existing multi-document Job object.
689 However, if a client needs to indicate that the previous Send-URI or Send-Document was the last document, the
690 client MUST use the Send-Document operation (see section 4.1) with no document data and the "last-document" flag
691 set to 'true' as specified in [rfc2911] section 3.3.2 (rather than using a Send-URI operation with no "document-uri"
692 Operation attribute).

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

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

697 **4.3 Get-Document-Attributes**

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

702 The Printer MUST return the Document Description attributes that a client supplied in the Document Creation
703 operation (Print-Job, Print-URI, Send-Document or Send-URI) as Operation attributes (see the PJ/PU and SD/SU
704 columns in Table 8 and the Doc column in Table 11), any Document Template attribute supplied by Send-Document
705 or Send-URI operations (see the D column in Table 10), plus any additional Document Description attributes that the
706 Printer has generated, such as "document-state" (see the Doc column in Table 11). The Printer MUST NOT return
707 any Job Level attributes that the Document object inherits and MUST NOT factor out common Document object
708 attributes and return them as Job object attributes. Thus the Get-Document-Attributes returns to clients only the
709 attributes that clients submitted in Document Creation operations, plus the additional Document Description attributes
710 that the Printer sets.

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

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

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

721 - 'document-description': the subset of the Document Description attributes specified in the "Doc" column of
 722 Table 11 that the implementation supports for Document objects.

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

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

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

731 4.3.1 Get-Document-Attributes Request

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

734 Group 1: Operation Attributes

735 Natural Language and Character Set:

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

737 Target:

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

743 Requesting User Name:

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

746 4.3.1.1 "requested-attributes" (1setOf keyword):

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

750 4.3.2 Get-Document-Attributes Response

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

752 Group 1: Operation Attributes

753 Status Message:

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

757 Natural Language and Character Set:

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

761 Group 2: Unsupported Attributes

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

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

768 Group 3: Document Object Attributes

769 The Printer returns the set of requested Document Template attributes (see the D column in Table 10) and
770 Document Description attributes (see the Doc column in Table 11) and their current values. The Printer
771 ignores (does not respond with) any requested attribute or value which is not supported. Furthermore, the
772 Printer MUST NOT return Document Template attributes that were not supplied by a client in a Send-
773 Document or Send-URI request or set by a Set-Document-Attributes request. So the response reflects what
774 was submitted. The Printer MAY omit returning attributes that are restricted by the Printer's security policy in
775 force, including whether the requesting user is the user that submitted the job (job originating user) or not
776 (see [rfc2911] section 8). However, the Printer MUST respond with the 'unknown' value for any supported
777 attribute (including all REQUIRED attributes) for which the Printer does not know the value, unless it would
778 violate the security policy. See the description of the "out-of-band" values in the beginning of [rfc2911]
779 Section 4.1.

780 4.4 Set-Document-Attributes

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

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

792 If a client supplies a document attribute in a Set-Documents-Attributes request that the Printer supports, and the
 793 document was originally submitted without supplying that attribute, the Printer adds the attribute to the Document
 794 object.

795 If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [rfc3380] section 8.2),
 796 then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic
 797 effect of the client supplying the 'delete-attribute' value in a Set-Documents-Attributes operation MUST be the same as
 798 if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
 799 applies its default attribute or behavior with lower precedence than the PDL (see the beginning of [rfc2911] section
 800 4.2 and [rfc2911] 3.2.1.1). Any subsequent query of the Document object using Get-Documents-Attributes or Get-
 801 Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
 802 However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
 803 subsequent Set-Documents-Attributes operation.

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

808 The validation of the Set-Documents-Attributes request is performed by the Printer as if the document had been
 809 submitted originally with the new attribute values (and the deleted attributes removed) and with "ipp-attribute-fidelity"
 810 set to 'true', i.e., all modified attributes Document attributes and values MUST be supported in combination with the
 811 Document attributes not modified. If such a Document Creation operation would have been accepted, then the Set-
 812 Documents-Attributes MUST be accepted. If such a Document Creation operation would have been rejected, then the
 813 Set-Documents-Attributes MUST be rejected and the Document MUST be unchanged. In addition, if any of the
 814 supplied attributes are not supported, are not settable, or the values are not supported, the Printer MUST reject the
 815 entire operation; the Printer MUST NOT partially set some of the supplied attributes. In other words, after the
 816 operation, all the supplied attributes MUST be set or none of them MUST be set, thus making the Set-Documents-
 817 Attributes an atomic operation.

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

823 The Printer MUST accept or reject this operations when the Document's READ-ONLY "document-state" attribute has
 824 the values shown in Table 6. The document's current state MUST affect whether the Printer accepts or rejects the
 825 request. However, the Set-Documents-Attributes operation MUST NOT change the state of the Document object
 826 (since the Document is a passive object and the Document state is a subset of the Job State). For example, in the
 827 case where the operation creates a request for unavailable resources, the Job (but not the Document) transitions to a
 828 new state. Table 6 shows the allowed behaviors in each document state.

829

Table 6 - Document State Table for the Set-Documents-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

Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
		document has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

830

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

834 **4.4.1 Settable and READ-ONLY Document Description attributes**

835 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:
836 all Document Template document ("xxx") attributes
837 that the implementation supports (see the column labeled "D" in Table 10).

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

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

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

848 **4.4.2 Set-Document-Attributes Request**

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

850 **Group 1: Operation Attributes**

851 **Natural Language and Character Set:**

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

853 **Target:**

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

859 Note: There is no way in a single operation for the client to set all of a Job's Document objects to the same
860 attribute value. Either (1) the client sets the corresponding attribute in each Document object in the Job with
861 separate Set-Document-Attributes requests, or (2) the client sets the corresponding attribute at the Job Level
862 using the Set-Job-Attributes operation. Setting the corresponding attribute at the Job Level (or supplying that
863 attribute initially in the Job Creation operation) causes each Document object to inherit the Job Level

864 attribute value, if the Document object doesn't have a corresponding explicit attribute supplied at the
865 Document Level. In other words, supplying an attribute at the Job Levels will affect all the Job's Document
866 objects that don't have that attribute also explicitly supplied at the Document Level.

867 **Requesting User Name:**

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

870 **Group 2: Document Attributes**

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

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

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

884 **4.4.3 Set-Document-Attributes Response**

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

886 **Group 1: Operation Attributes**

887 **Status Message:**

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

891 **Natural Language and Character Set:**

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

893 **Group 2: Unsupported Attributes**

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

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

- 900 1. The number of attributes supplied by the client exceeds the maximum number that the Printer
901 supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see
902 [rfc2911] section 13.1.4.9).

- 903 2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band
904 attribute value (see [rfc2911] section 3.1.7 and [rfc2910]) and the 'client-error-attributes-or-values-
905 not-supported' (see [rfc2911] section 13.1.4.12).
- 906 3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation: return the
907 attribute with the 'not-settable' out-of-band attribute value (see [rfc3380] section 8.1) and the
908 'client-error-attributes-not-settable' status code (see [rfc3380] section 7.1).
- 909 4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.
910 If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
911 supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [rfc2911]
912 section 13.1.4.12).
- 913 5. The values of some of the supplied attributes conflict with one another and/or other Document
914 attribute values not being set: if the conflicting attribute in the operation has a single value return
915 the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute
916 and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-
917 conflicting-attributes' status code (see [rfc2911] section 13.1.4.15).

918 **4.5 Cancel-Document**

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

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

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

935 The Printer MUST accept or reject the request based on the document's current state and transition the document to
936 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'

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

942

943

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

944

945

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947

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

948

4.5.1 Cancel-Document Request

949

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

950

Group 1: Operation Attributes

951

Natural Language and Character Set:

952

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

953

Target:

954

955

956

957

958

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 section [rfc2911] 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.

959

Requesting User Name:

960

961

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

962

4.5.1.1 document-message (text(MAX))

Operation attribute

963

964

965

966

967

968

The client MAY supply this Operation attribute. If the Printer supports this attribute, the Printer MUST also support the corresponding "document-message" (text(MAX)) Document Description attribute (see section 9.1.18) and copy this value to the "document-message" Document Description attribute. The end user can use this Document Description attribute as a message to the operator and the operator can use it as a message to the user. The Printer MAY print this message on a document start sheet for this document, if any.

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

971 4.5.2 Cancel-Document Response

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

973 Group 1: Operation Attributes

974 Status Message:

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

978 Natural Language and Character Set:

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

980 Group 2: Unsupported Attributes

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

982 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
983 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document
984 enters the 'canceled' document-state (see section 9.1.23), the "document-state-reasons" attribute (see section
985 9.1.25) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the
986 Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

987 5 Administrative Job and Document operations

988 This section summarizes the extensions to existing Administrative Job and Printer operations and defines new
989 Document Administrative operations. The following administrative operations: **Promote-Job** ([adm-ops] section
990 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2), **Resume-Job** ([adm-ops] section 4.3.2), **Schedule-Job-**
991 **After** ([adm-ops] section 4.4.2) do not affect the Document objects because they are defined to affect the Job object
992 as a whole.

993 5.1 Purge-Jobs ([rfc2911] section 3.2.9)

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

995 5.2 Cancel-Current-Job ([adm-ops] section 4.2)

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

1000 Note: There is no Cancel-Current-Document operation defined, since it is too likely that the Printer would have
1001 moved onto the next document before the operation could issue the request.

1002 **5.3 Suspend-Current-Job** ([adm-ops] section 4.3.1)

1003 This OPTIONAL Administrative Printer operation suspends the current job and sets the Job's "job-state" Job
 1004 Description attribute to 'processing-stopped' and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user'
 1005 or 'operator'. The Documents' "document-state" and "document-state-reasons" Document Description attributes are
 1006 unaffected (but the Documents are not processed any further, since the Job is stopped).

1007 **5.4 Delete-Document**

1008 This OPTIONAL Administrative Document operation removes the specified Document object and its data
 1009 immediately from the specified Job. The Printer MUST reject the request if the Document is in any state, but
 1010 'pending' (there is no 'pending-held' state for Documents). The Printer does not reassign the "document-number"
 1011 Document Description attribute values of the remaining Document objects in the Job, so that the deleted Document
 1012 object leaves a gap in the document numbering space for the Job. The Printer MUST return a 'client-error-not-found'
 1013 status code, in a subsequent Get-Document-Attributes operation for this Document object specifying its former
 1014 "document-number". This operation is similar to the Purge-Jobs operation that immediately deletes all jobs from the
 1015 Printer. However, the Delete-Document operation only deletes a single Document from the specified Job.

1016 *Access Rights:* The authenticated user (see [rfc2911] section 8.3) performing this operation MUST be an operator or
 1017 administrator of the Printer (see [rfc2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and
 1018 return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate. This
 1019 operation requires operator/administrator privileges, otherwise a rogue client could submit, then delete, at will using
 1020 up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-Document which goes
 1021 through the normal accounting, if any.

1022 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
 1023 Cancel-Document operation (see section 4.5).

1024 **6 Job and Document Template Attribute Precedence during Job processing**

1025 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
 1026 instructions in the PDL data. These rules cover Queue Override attributes, Page Override attributes, Document
 1027 Object attributes (Operation/Document Description and Document Template), Document Override attributes, Job
 1028 Object attributes (Operation/Job Description and Job Template), PDL instructions, PDL Interpreter initialization files,
 1029 and Printer's defaults. Since each attribute can be specified for all of these levels, it is important to define which level
 1030 takes precedence when the same attribute occurs at different levels with differing values.

1031 The attribute precedence model has the following features:

- 1032 1) In principle, each defined attribute can occur at each of the precedence levels.
- 1033 2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1034 driver, submission client, protocol, and Printer:
- 1035 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,
 1036 operator, Printer, and the output device hardware.
 - 1037 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
 1038 pending, job processing.
- 1039 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1040 driver, submission client, protocol, and Printer.

1041 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is to
 1042 the affected object, the higher the precedence is assigned to that attribute, since precedence is intended to
 1043 reflect the user's wishes.

1044 The following levels of Attribute Precedence are defined in order of decreasing priority:

1045 1. **queue override** - The value that the Printer enforces for any job submitted to it (see [ippsave] section
 1046 3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
 1047 to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =
 1048 'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
 1049 long edge.

1050 Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for
 1051 its "pdl-override-supported" attribute (see [ippsave] section 8.1). All other levels are available for all
 1052 Printers independent of the "pdl-override-supported" value.

1053 2. **Document Level - page override programming** - The special "overrides" collection Document
 1054 Template attribute (see [OvrRide]) supplied at the Document Level, that is, as a Document Template
 1055 Attribute in a Send-Document or Send-URI operation, that contains the attributes that are to have the
 1056 page override status for the specified ranges of pages. Supplied by the client when submitting a
 1057 Document object, or set by the user or operator after the Document has been accepted either using the
 1058 Set-Document-Attributes operation, or by the operator using means local to the Printer. Example: "
 1059 overrides" = {"pages" = '1:1'; "media" = 'letterhead'}

1060 3. **Job Level - page override programming** - The special "overrides" collection Job Template attribute
 1061 (see [OvrRide]) supplied at the Job Level, that is, in a Job Creation operation, that contains the attributes
 1062 that are to have the page override status for the specified ranges of pages in the specified Document.
 1063 Supplied by the client when submitting a job either in the protocol, or set by the user or operator after the
 1064 job has been accepted either using the Set-Job-Attributes operation, or by the operator using means
 1065 local to the Printer. Example: "overrides" = {"pages" = '1:1'; "document-numbers" = '1:1'; "media" =
 1066 'letterhead'}

1067 4. **Document Level - Document object attributes** - The Document attributes supplied at the Document
 1068 Level, that is, Operation/Document Description and Document Template attributes supplied in a Send-
 1069 Document or Send-URI operation to apply to the Input Document. Supplied by the client when
 1070 submitting a Document object, or set by the user or operator after the Document has been accepted
 1071 either using the Set-Job-Attributes operation, or by the operator using means local to the Printer.
 1072 Examples: "media" = 'na-letter' and "copies" = '2'.

1073 5. **Job Level - Job object and Document object attributes** - The Job attributes (Operation/Job
 1074 Description and Job Template) and Document attributes (Operation/Document Description and
 1075 Document Template) supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation.
 1076 Supplied by the client when submitting a Job in the protocol, or set by the user or operator after the job
 1077 has been accepted either using the Set-Job-Attributes operation, or by the operator using means local to
 1078 the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.

1079 6. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print
 1080 driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether
 1081 PDL document data is actually lower precedence than the preceding levels depends on the
 1082 implementation as expressed in the "pdl-override-supported" Printer Description attribute (see [rfc2911]
 1083 section 4.4.28 and [ippsave] section 8.1).

1084
 1085 Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
 1086 requested" (see [rfc2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a

1087 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
 1088 attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
 1089 requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
 1090 and PCL MAY omit orientation, in which case, "orientation-requested" takes affect.

1091 7. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
 1092 each document in a Job. See description of "pdl-init-file" Job Template attribute in [ippsave] Section 5.8.
 1093 It is immaterial how this file is specified, whether it be by a queue override, job object attribute or printer
 1094 default – the precedence of the contents of this file is at this level.

1095 8. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
 1096 higher levels have supplied a value. The Printer implementation supplies values for the Printer's "xxx-
 1097 default" attributes that reflect the out-of-the-box action by the output device. For example, if the output
 1098 device will use media from the large-capacity input tray if not directed otherwise, the implementation
 1099 supplies the Printer's "media-default" attribute with the 'large-capacity' keyword value without requiring
 1100 the administrator to configure that value. Implementation allow the administrator to configure the
 1101 Printer's "xxx-default" attributes to other values, if other value are supported by the implementation.
 1102 Example: The administrator changes the Printer's "media-default" from 'large-capacity' to 'na-letter'.

1103 9. **Hardware default** - When none of the above the above conditions supply an explicit value, the printer
 1104 will apply the defaults supplied by the hardware. An example of these implicit defaults would be a
 1105 "copies" value of 1 or a "sides" value of 'one-sided'.

1106

1107 7 Operation Attributes for the Job and Document Creation operations

1108 This section defines some new Operation/Description attributes and lists *all* the Operation/Description attributes that
 1109 have been defined in other IPP specifications that are used in Job Creation operations and extends their use to the
 1110 Document Creation operations. In addition, some new Job/Document Description attributes have been defined to be
 1111 set from existing Operation attributes. Note: Operation attributes relate to the operation and do not depend on the
 1112 printing capabilities of the Printer.

1113 7.1 Operation Attributes *supplied* at the Job and Document Levels for Creation

1114 Table 7 lists all the Operation attributes and their attributes syntaxes supplied in Job Creation and Document
 1115 Creation operations and the attribute syntaxes of their corresponding "xxx-default" and "xxx-supported" Printer
 1116 Description attributes, if any. A "-" indicates that there isn't a "xxx-default" or "xxx-supported" Printer Description
 1117 attribute.

1118 **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 ¹⁵
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

¹⁵ 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	mimeMediaType	mimeMediaType	1setOf mimeMediaType
document-format-details	1setOf collection	1setOf collection	1setOf type2 keyword ¹⁶
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 ¹⁷
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 ¹⁸
original-requesting-user-name	name(MAX)	-	-
output-device-requested	name(127)	-	1setOf name(MAX)
printer-uri	uri	-	1setOf uri
request-id	integer(1:MAX)	-	-
requesting-user-name	name(MAX)	-	-
version-number	X.Y	-	1setOf type2 keyword ¹⁹

1119

1120 Table 8 lists the Operation attributes that clients supply at the Job Level and/or the Document Level and whether the
 1121 Printer copies (indicated by “⇒”) the supplied value to corresponding Job Description and/or Document Description
 1122 attributes.

1123 Legend:

1124 **[job-]** an attribute that shouldn't have had a "job-" prefix in its name in [rfc2911], so that the same attribute name
 1125 could also be used for the Document object as an Operation/Document Description attribute. When this
 1126 attribute is used as an Operation/Document Description attribute, the **[job-]** prefix is dropped. Note: For the
 1127 PWG Semantic Model, the "job-" prefix is dropped altogether.

¹⁶ There is also a "document-format-details-implemented" (1setOf collection), see [jobx] §7.7.

¹⁷ The Supported Printer attribute is named "reference-uri-schemes-supported" (see [rfc2911] section 4.4.27), rather than "document-uri-supported".

¹⁸ The Supported Printer attribute is named "operations-supported" (see [rfc2911] section 4.4.15), rather than "operation-id-supported".

¹⁹ The Supported Printer attribute is named "ipp-versions-supported" (see [rfc2911] section 4.4.14), rather than "version-number-supported".

- 1128 “**Level Supplied**” column indicates whether the Operation attribute can be supplied at the Job Level (PJ=Print-Job,
 1129 PU=Print-URI, and CJ=Create-Job) and at the Document Level (SD=Send-Document, and SU=Send-URI) .
 1130 “**y**” the Operation attribute is defined for the indicated operation, but does not have a corresponding Job
 1131 Description or Document Description attribute (no “ \Rightarrow ”).
 1132 “**y \Rightarrow** ” the Operation attribute has a corresponding Document Description attribute to which the Printer **MUST** copy
 1133 this Operation attribute. See Table 11 for the corresponding Job and Document Description attributes.
 1134 “**-**” the Operation attribute is *not* defined for the indicated operation.
 1135 ****** these Operation attributes are defined for *all* operations, not just Job Creation and Document Creation
 1136 operations
 1137 “**Conformance**” column indicates the conformance requirements for what the client supplies in a request and the
 1138 Printer supports in a request.
 1139 “**Reference and Section**” column indicates where the Operation attribute is defined in other IPP specs and this spec.
 1140

1141 **Table 8 - Operation Attributes supplied at the Job and Document Levels in Job and Document Creation**
 1142 **Requests**

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	SD, SU			
attributes-charset **	charset	y\RightarrowJ	y\RightarrowJ	y\RightarrowD	MUST	MUST	[rfc2911] §3.1.4
attributes-natural-language **	naturalLanguage	y\RightarrowJ	y\RightarrowJ	y\RightarrowD	MUST	MUST	[rfc2911] §3.1.4
compression	type3 keyword	-	y\RightarrowD	y\RightarrowD	MAY	MUST	[rfc2911] §3.2.1.1
document-charset	charset	-	y\RightarrowD	y\RightarrowD	MAY	CMUS T ²⁰	[jobx] §43.2.1
document-digital-signature	type2 keyword	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.2
document-format	mimeMediaType	-	y\Rightarrow²¹D	y\RightarrowD	MAY	MUST	[rfc2911] §3.2.1.1, [jobx] §3.2.3
document-format-details	1 setOf collection	-	y\RightarrowD	y\RightarrowD	MAY	CMUS T ²²	[jobx] §3.2.4
document-source-application-name	name(MAX)	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.4.1
document-source-application-version	text(127)	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.4.2
document-source-os-name	name(40)	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.4.3
document-source-os-version	text(40)	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.4.4
document-format	mimeMediaType	-	y\RightarrowD	y\RightarrowD	MUST	MUST	[jobx] §3.2.4.5
document-format-device-id	text(127)	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.4.6
document-format-version	text(127)	-	y\RightarrowD	y\RightarrowD	SHOUL D	MUST	[jobx] §3.2.4.7
document-natural-language	naturalLanguage	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.4.8
document-format-version	text(127)	-	y\RightarrowD	y\RightarrowD	MAY	MAY	[jobx] §3.2.6
				y\RightarrowD			

²⁰ The Printer **MUST** support the “document-charset” Operation/Document Description attributes, if the Printer supports a charset-ambiguous document format (see [jobx] §3.2.1)

²¹ The Printer **MUST** copy the “document-format” Operation attribute to the corresponding (new) Document Description attribute defined in this specification.

²² 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	SD, SU			
document-name	name(MAX)	-	y⇒D	y⇒D	MAY	MUST	[rfc2911] §3.2.1.1
document-natural-language	naturalLanguage	-	y⇒D	y⇒D	MAY	MAY	[rfc2911] §3.2.1.1, [this spec] §7.2.1
document-uri	uri	-	y	y⇒D	CMUST ²³	MAY	[rfc2911] §3.2.2
ipp-attribute-fidelity	boolean	y⇒ ²⁴ J	y⇒ ²⁴ J	-	MAY	MUST	[rfc2911] §3.2.1.1, [this spec] §3.1.1.1
[job-]impressions	integer(0:MAX)	y⇒J	y⇒J	y⇒D	MAY	MAY	[rfc2911] §3.2.1.1
[job-]k-octets	integer(0:MAX)	y⇒J	y⇒J	y⇒D	MAY	MAY	[rfc2911] §3.2.1.1
job-mandatory-attributes	1 setOf type2 keyword	y⇒J	y⇒J	-	MAY	MUST	[this spec] §3.1.1.2
[job-]media-sheets	integer(0:MAX)	y⇒J	y⇒J	y⇒D	MAY	MAY	[rfc2911] §3.2.1.1
job-name	name(MAX)	y⇒J	y⇒J	-	MAY	MUST	[rfc2911] §4.3.5
job-password	octetString(255)	y⇒J	y⇒J	-	MAY	MAY	[ippsave] §4.1
job-password-encryption	type3 keyword name(MAX)	y⇒J	y⇒J	-	MAY	MAY	[ippsave] §4.2
last-document	boolean	-	-	y⇒D ²⁵	MUST	MUST	[rfc2911] §3.3.1.1
operation-id **	integer(1:0x8FFF)	y	y	y	MUST	MUST	[rfc2911] §3.1.2
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] §5.5
printer-uri **	uri	y⇒ Error! Bookmark not defined. J	y⇒ ²⁶ 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

1143 “y”, “y⇒”, and “**”. See Legend at the beginning of the Table.
1144

²³ 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.

²⁴ 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.

²⁵ 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.

²⁶ 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.

1145 7.2 Operation/Document Description attributes

1146 The rest of this section defines the semantics for the Operation attributes that a client MAY supply in a Document
1147 Creation operation and their corresponding Document Description attributes. The following statements apply to all of
1148 these Operation/Document Description attributes and are *not* repeated in each Description:

1149 If the Printer doesn't support the "xxx" Operation attribute, the Printer MUST ignore the "xxx" attribute (as with any
1150 OPTIONAL Operation attribute) and return the "xxx" attribute with the supplied value as unsupported in the
1151 Unsupported attributes group as specified in [rfc2911] section 3.1.7.

1152 If the Printer supports the "xxx" Operation attribute, the Printer MUST support it at the Job and Document level. The
1153 Printer MUST also:

- 1154 1. support the corresponding "xxx" Document Description attribute of the same name (see section 9.1) and vice
1155 versa.
- 1156 2. copy the value of the "xxx" Operation attribute, if supplied by the client, to the corresponding "xxx" Document
1157 Description attribute.
- 1158 3. support the corresponding "xxx-default" and "xxx-supported" Printer Description attributes as well, if defined
1159 (see section 10) and vice versa.
- 1160 4. validate the values supplied by the client in the "xxx" Operation attribute against the values indicated in the
1161 Printer's corresponding "xxx-supported" Printer Description attribute (see section 10). If the values do not
1162 validate, the Printer MUST either reject the operation or accept the operation as indicated for each of the
1163 attributes described below.

1164 If the client supplies one of the "xxx" Operation/Document attributes with a value that the Printer does not support,
1165 the Printer MUST perform one of the actions indicated for that Operation, unless specified otherwise, such as (1)
1166 reject the request, (2) accept the request and either (a) hold the job for operator intervention or (b) print the Job
1167 ignoring the attribute. In all of these cases, the Printer MUST return the Operation attribute with the unsupported
1168 value in the Unsupported Attributes group in the response (see [rfc2911] section 3.1.7).

1169

1170 7.2.1 document-natural-language (naturalLanguage)

1171 This OPTIONAL Operation attribute specifies the natural language of the Document Object content (see [rfc2911]
1172 section 3.2.1.1 and section 4.1.8).

1173 If the client supplies this "document-natural-language" Operation attribute with a value that the Printer doesn't
1174 support, the Printer MUST perform one of the following actions: (1) reject the request OR (2) accept the request and
1175 either (a) put the Job in the 'pending-held' state or (b) process the job ignoring the attribute. See section 7.2 above
1176 for more details.

1177 The values MAY include region as well as the language according to [rfc2911] section 4.1.8. If the document
1178 contains more than one language, the value is the first or primary language of the document. The Printer MAY use
1179 this value to select fonts or other Internationalization processing. As indicated in [rfc2911] section 4.1.8, example
1180 include:

1181 'en': for English
1182 'en-us': for US English
1183 'fr': for French
1184 'de': for German
1185

1186 **7.3 Operation Attributes returned in Job and Document Creation responses**

1187 Table 9 lists the Operation attributes that Printers return in Job Creation operation responses: Print-Job, Print-URI,
 1188 and Create-Job and in Document Creation operation responses: Send-Document and Send-URI. The column
 1189 labeled “Conformance” indicates the conformance for what the Printer returns and what the Printer supports. The
 1190 Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1191 **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) ²⁷	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

1192 * - indicates attributes that are defined for all operations, not just Job Creation operations
 1193

1194 **8 Job Template and Document Template attributes**

1195 Table 10 lists all of the Job Template attributes defined in other IPP specifications and lists their corresponding
 1196 Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the
 1197 Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

1198 A subset of these Job Template attributes (e.g., “number-up” and “media”, but not “job-priority”) are also defined to
 1199 apply to Documents and are called Document Template attributes when supplied at the Document Level. Document
 1200 Template attributes can be supplied in the Send-Document and Send-URI operations.

²⁷ 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.

1201 A subset of the Document Template attributes that apply to pages (e.g., “media”, but not “document-format” or “job-
 1202 priority”) can also be supplied as Page Overrides using the “overrides” Job Template collection attribute (see
 1203 [OvrRide]) or as a Document Template attribute.

1204 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
 1205 a Job Creation or Document Creation request or Page Overrides. If a Printer supports a Job Template or Document
 1206 Template attribute, then it MUST copy the supplied attribute to the Job or Document object, respectively so that a
 1207 client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-Document-Attributes/Get-
 1208 Documents operations, respectively. The effect of Job Template Attributes supplied in Job Creation requests are
 1209 inherited by the Document objects, unless the Document Creation operation supplies the attribute with a different
 1210 value.

1211 If a Job Template collection attribute is supported (see [rfc3382]), then there are conformance requirements for which
 1212 member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
 1213 Conformance column for each collection member attribute in Table 10.

1214 The “Defined for use” column indicates whether the client MAY supply and the Printer support the attribute at the
 1215 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.

1216
 1217 “***” - Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job
 1218 Processing and Document Processing attributes, respectively. However, 4 of the IPP Job Template
 1219 attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job
 1220 Processing attributes. These are indicated in the first column with “***”.

1221 **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 ²⁸	y	n	MAY	MAY	[rfc2911] §4.2.5

²⁸ 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

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
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 ²⁹	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 ²⁹	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 ³⁰	y	y	MAY	MAY	[pwg5100.3] §3.3
imposition-template	type2 keyword name(MAX)	y	y	y	MAY	MAY	[pwg5100.3] §3.4
insert-sheet	1setOf collection	y ³⁰	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

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.

²⁹ 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.

³⁰ 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	
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 ³¹	n	MAY	MAY	[jobx] §4.1.1
job-cover-back	collection	y	n ³²	n	MAY	MAY	[jobx] §4.1.2
<i>same as cover-back</i>	<i>see cover-back</i>						
job-cover-front	collection	y	n ³³	n	MAY	MAY	[jobx] §4.1.3
<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 ³⁴	n	MAY	MAY	[jobx] §4.1.4
job-finishings-col	collection	y	n ³⁵	n	MAY	MAY	[jobx] §4.1.5
<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 ³⁶	n	MAY	MAY	[pwg5100.3] §3.10

³¹ 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’.

³² 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’.

³³ 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’.

³⁴ 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’.

³⁵ 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’.

³⁶ 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-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
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 ³⁷	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 ³⁸	[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

³⁷ UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

³⁸ 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
overrides	1setOf collection	y ³⁹	y	n	MAY	MAY	[OvrRide] §4.1, also see §8.2
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[OvrRide] §4.1.1
Documen-numbers	1setOf rangeOfInteger(1:MAX)				MAY	MUST	[OvrRide] §4.1.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[OvrRide] §4.1.3
<i>any other Job Template attributes that affect pages, such as "media" or "media-col"</i>					MAY	MAY	[OvrRide] §4.1.4
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-ranges	1setOf rangeOfInteger(1:MAX)	y	y	n	MAY	MAY	[rfc2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	y ⁴⁰	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

³⁹ 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.

⁴⁰ 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

1222 “***” - These 4 attributes are Job Description attributes, not Job Processing attributes, in the PWG Semantic Model
 1223 [pwg-sm] - see Legend before the Table.
 1224

1225 8.1 Document Template attributes

1226 Most Job Template attributes can be used as Document Template attributes for use in Document Creation
 1227 operations to apply to the Document object. However, the Job Template attributes that have the “job-“ prefix MUST
 1228 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 10
 1229 shows lists all of the Document Template attributes for use with the Document Creation operations and the
 1230 Document object. All of the definitions of the Document Template attributes are done by reference to the
 1231 corresponding Job Template attributes in other specifications. However, the semantics of each Document Template
 1232 attribute only applies to the Document object with which the attribute is associated either by being supplied by the
 1233 client in the Document Creation operation or supplied by the Printer as a default because the client did not (and the
 1234 PDL did not have any corresponding instruction). See section 6 for defaulting semantics.

1235 The Document Template attribute share the same “xxx-default”, “xxx-supported”, and “xxx-ready” Printer attributes
 1236 with the Job Template attributes of the same name.

1237 The Document object also has the corresponding “xxx-actual” READ-ONLY Document Description attributes defined
 1238 that correspond to the “xxx” Document Template attributes (see [ippact]).

1239 8.2 Document Template attributes containing explicit Document numbers

1240 Job Template attributes that contain explicit Document numbers, such as “overrides”, must have an appropriate
 1241 value. The Document number MUST have a single value and the single value MUST match the Document number
 1242 to which the Document Template attributes are being applied. If they do not match the Printer MUST reject the
 1243 request with a status of ‘client-error-bad-request’.

1244 **9 Job Description and Document Description attributes**

1245 Table 11 lists all the Job Description defined in other IPP specifications and the corresponding Document Description
 1246 attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and
 1247 Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute
 1248 values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes
 1249 as flagged with “”. Unless specified otherwise herein, the Printer MUST NOT support modification of Job Description
 1250 and Document Descriptions attributes.

1251 The column labeled “attribute syntax” indicates the attribute syntax (see [rfc2911] section 4.1). The Printer
 1252 conformance is indicated along with the reference to the specification in which the attribute is defined. The
 1253 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
 1254 corresponding Job Description attributes.

1255 Each of the Document Description attributes have a sub-section in section 9.1. The column labeled References
 1256 column contains references to the sub-section in this document if there is significant information there. Those
 1257 subsections that are only references to other specifications contain only that reference in the Reference column.
 1258 Those attributes that are only Job Description attributes with no subsection in this specification have a “n/a” in the
 1259 “Doc Desc” column.

1260 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
 1261 object with a state and it cannot be queried.

1262 Legend:

- 1263 **[job-]** indicates an attribute that shouldn’t have had a “job-” prefix in its name in [rfc2911], so that the same attribute
 1264 name could also be used for the Document object as a Document Description attribute. Note: For the PWG
 1265 Semantic Model, the “job-” prefix is dropped.
- 1266 “-” indicates that the Job or Document attribute is *not* defined.
- 1267 “⇒y” the Printer MUST populate this Job or Document attribute by copying *from* the corresponding
 1268 Operation attribute that the client MAY supply⁴¹ in a Job or Document Creation operation. See Table 8 for
 1269 the corresponding Operation attribute.
- 1270 (r/w) indicates that the Job Description or Document Description attribute is read/write, so that the client can
 1271 changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 4.4).

1272 **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 ⁴²	-	§9.1.8

⁴¹ 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.

Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conformance	Reference	
					Job Description Attr	Doc Desc.
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 ⁴³	[jobx] §3.2.4	§9.1.11
document-source-application-name	name(MAX)	-	⇒y	MAY	[jobx] §3.2.4.1	
document-source-application-version	text(127)	-	⇒y	MAY	[jobx] §3.2.4.2	
document-source-os-name	name(40)	-	⇒y	MAY	[jobx] §3.2.4.3	
document-source-os-version	text(40)	-	⇒y	MAY	[jobx] §3.2.4.4	
document-format	mimeMediaType	-	⇒y	MUST	[jobx] §3.2.4.5	
document-format-device-id	text(127)	-	⇒y	MUST	[jobx] §3.2.4.6	
document-format-version	text(127)	-	⇒y	MAY	[jobx] §3.2.4.7	
document-natural-language	naturalLanguage	-	⇒y	MAY	[jobx] §3.2.4.8	
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
ipp-attribute-fidelity	boolean	⇒y	-	MUST	[rfc2911] §3.2.1.1 [jobx] §5.1	-
job-collation-type	type2 enum	y	-	MAY	[rfc3381] §4.1	-
detailed-status-message	1setOf text (MAX)	y	y	MAY	[rfc2911] §4.3.10	§9.1.28
document-access-errors	1setOf text(MAX)	y	y	MAY	[rfc2911] §4.3.11	§9.1.29
errors-count	integer(0:MAX)	y	y	MAY	[Jobx] §5.2	§9.1.30
job-id	integer (1:MAX)	y	-	MUST	[rfc2911] §4.3.2	-
impressions	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.2	§9.1.31
impressions-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.2	§9.1.32
k-octets	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.1	§9.1.33
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] §5.3	-
media-sheets	integer(0:MAX)	⇒y	⇒y	MAY	[rfc2911] §4.3.17.3	§9.1.35
media-sheets-completed	integer(0:MAX)	y	y	MAY	[rfc2911] §4.3.18.3	§9.1.36

⁴² The Printer MUST support the “document-charset” Operation/Document Description attributes if the Printer supports any charset-ambiguous document formats (see [jobx] §3.2.1).

⁴³ 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 conform-ance	Reference	
					Job Description Attr	Doc Desc.
job-message-from-operator	text(127)	y	- ⁴⁴	MAY	[rfc2911] §4.3.16	-
more-info	uri	y	y	MAY	[rfc2911] §4.3.4	§9.1.37
job-name(r/w)	name(MAX)	⇒y	- ⁴⁵	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 ₄₆	[ippsave] §6.1	-
printer-up-time	integer (1:MAX)	y	y	MUST	[rfc2911] §4.3.14.4	§9.1.38
job-printer-uri	uri	⇒⁴⁷y	-	MUST	[rfc2911] §4.3.3	-
job-state	type1 enum	y	- ⁴⁸	MUST	[rfc2911] §4.3.7	-
job-state-message	text(MAX)	y	- ⁴⁹	MAY	[rfc2911] §4.3.9	-
job-state-reasons	1setOf type2 keyword	y	- ⁵⁰	MUST	[rfc2911] §4.3.8	-
job-uri	uri	y	-	MUST	[rfc2911] §4.3.1	-
warnings-count	integer(0:MAX)	y	y	MAY	[Jobx] §5.3	§9.1.39
last-document	boolean	-	⇒y	MAY	[rfc2911] §4.3.12	§9.1.40
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	[jobx] §5.5	-
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

1273 "y", "⇒y", "-" See the description in the Legend before the table.

1274

1275 Most of the existing "job-state" and "job-state-reasons" Job Description attribute values apply equally well to
 1276 individual documents in a multi-document job (with removal of the 'job-' prefix for those that apply to both Job and
 1277 Document). The reason for separating state from reasons, is so that the states can be the fundamental states that
 1278 most implementations have, while the state reasons can vary depending on the sophistication of the system. The

⁴⁴ 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 9.1.18) to communicate with each other.

⁴⁵ The Document Description attribute that corresponds to the "job-name" Job Description attribute is the (existing) "document-name" attribute defined in [rfc2911].

⁴⁶ The Printer MUST support the "job-printer-make-and-model" Job Description attribute if the "job-save-disposition" Job Template attribute is supported.

⁴⁷ The Printer sets the "job-printer-uri" Job Description attribute from the "printer-uri" Operation attribute.

⁴⁸ The Document Description attribute that corresponds to the "job-state" Job Description attribute is the (new) "document-state" attribute.

⁴⁹ The Document Description attribute that corresponds to the "job-state-message" Job Description attribute is the (new) "document-state-message" attribute.

⁵⁰ The Document Description attribute that corresponds to the "job-state-reasons" Job Description attribute is the (new) "document-state-reasons" attribute.

1279 states are the ones that clients are most likely to base actions upon, and the state reasons are more information,
1280 both for programs and people.

1281 **9.1 Document Description attributes**

1282 This section contains *all* of the Document Description attributes for use with the Document object. Most of these
1283 definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
1284 semantics of each Document Description attribute only applies to the Document object containing the Document
1285 Description attribute. The Printer MAY support changing these Document Description attributes with the Set-
1286 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!

1287 **9.1.1 attributes-charset (charset)**

1288 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1289 attribute (see [rfc2911] §4.3.19) applied to the Document object. The Printer sets this Document Description attribute
1290 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1291 4.1).

1292 **9.1.2 attributes-natural-language (naturalLanguage)**

1293 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1294 attribute (see [rfc2911] §4.3.20) applied to the Document object. The Printer sets this Document Description attribute
1295 from the corresponding Operation attribute supplied by the client in the Document Creation operation (see section
1296 4.1).

1297 **9.1.3 compression (type3 keyword)**

1298 This REQUIRED Document Description attribute specifies the compression used to represent this document (see
1299 [rfc2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding Operation attribute
1300 supplied by the client in the Document Creation operation (see section 4.1).

1301 **9.1.4 current-page-order (type2 keyword)**

1302 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1303 attribute (see [pwg5100.3] §4.1) applied to the Document object.

1304 **9.1.5 date-time-at-completed (dateTime)**

1305 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1306 attribute (see [rfc2911] §4.3.14.7) applied to the Document object.

1307 **9.1.6 date-time-at-creation (dateTime)**

1308 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1309 attribute (see [rfc2911] §4.3.14.5) applied to the Document object.

1310 9.1.7 date-time-at-processing (dateTime)

1311 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1312 attribute (see [rfc2911] §4.3.14.6) applied to the Document object.

1313 9.1.8 document-charset (charset)

1314 This OPTIONAL Document Description attribute specifies the charset used to represent this document (see [jobx]
1315 §4.2.1). The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by
1316 the client in the Document Creation operation (see section 4.1).

1317 9.1.9 document-digital-signature (type2 keyword)

1318 This OPTIONAL Description attribute specifies the digital signature technology used in the Document content. The
1319 Printer sets this Document Description attribute from the corresponding "document-digital-signature" Operation
1320 attribute ([jobx] §4.2.2 for the semantics), if supplied by the client in the Document Creation operation (see section
1321 4.1). If a Printer supports the "document-digital-signature" Operation attribute, the Printer MUST support this
1322 "document-digital-signature" Document Description attribute.

1323 9.1.10 document-format (mimeMediaType)

1324 This REQUIRED⁵¹ Document Description attribute specified the document format of the Document Object content.
1325 The Printer sets this Document Description attribute from the corresponding "document-format" Operation attribute
1326 (see section [jobx] §4.2.3 for the semantics), if supplied by the client in the Document Creation operation (see section
1327 4.1).

1328 9.1.11 document-format-details (1setOf collection)

1329 This OPTIONAL Description attribute specifies the details of the document format(s) of the Document Object content.
1330 The Printer sets this Document Description attribute from the corresponding "document-format-details" Operation
1331 attribute ([jobx] §4.2.4 for the semantics), if supplied by the client in the Document Creation operation (see section
1332 4.1). . If a Printer supports the "document-format-details" Operation attribute, the Printer MUST support this
1333 "document-format-details" Document Description attribute.

1334 9.1.12 document-format-details-detected (1setOf collection)

1335 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format details of the
1336 Document object as detected by the Printer. The member attributes are the same as the "document-format-details"
1337 Operation attribute. (see [jobx] §6.6.4 for details)

1338 9.1.13 document-format-detected (mimeMediaType)

1339 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format of the
1340 Document object content as detected by the Printer. See [jobx] §6.6.5 for detailed semantics.

1341 9.1.14 document-format-version (text(127))

1342 This OPTIONAL Description attribute specifies the version of the document format of the Document Object content.
1343 The Printer sets this Document Description attribute from the corresponding "document-format-version" Operation
1344 attribute ([jobx] §4.2.6 for the semantics), if supplied by the client in the Document Creation operation (see section

⁵¹ [rfc2911] did not define a "document-format" Document Description attribute; it is a new attribute defined in this specification.

1345 4.1). If a Printer supports the “document-format-version” Operation attribute, the Printer MUST support this
1346 “document-format-version” Document Description attribute.

1347 **9.1.15 document-format-version-detected (text(127))**

1348 This OPTIONAL Description attribute is generated by the Printer to indicate the actual document format version of
1349 the Document content as detected by the Printer. See [jobx] §6.6.7 for detailed semantics..

1350 **9.1.16 document-job-id (integer(1:MAX))**

1351 This REQUIRED Document Description attribute is a *copy* of the Job’s “job-id” Job Description attribute (see
1352 [rfc2911] §4.3.2), i.e., the “job-id” of the Job containing this Document.

1353 **9.1.17 document-job-uri (uri)**

1354 This REQUIRED Document Description attribute is a *copy* of the Job’s “job-uri” Job Description attribute (see
1355 [rfc2911] §4.3.1), i.e., the URI of the Job that contains this Document. Example:
1356 `ipp://www.company.com/printers/myprinter/jobs/22`

1357 **9.1.18 document-message (text(MAX))**

1358 This OPTIONAL Document Description contains a message from either (1) the user to the operator about the
1359 Document or (2) from the operator, system administrator, or “intelligent” process to indicate to the end user the
1360 reasons for modification or other management action taken on the Document. The Printer populates this Document
1361 Description attribute from the “document-message” (text(MAX)) Operation attribute value supplied by the client in any
1362 of the Document Creation operations (see section 4.1) or in a Cancel-Document operation (see section 4.5).

1363 In addition, the user and the operator can set the value of this Document Description attribute explicitly using the Set-
1364 Document-Attributes operation (see section 4.4).

1365 **9.1.19 document-name (name(MAX))**

1366 This REQUIRED Document Description attribute specifies the name of the document (see [rfc2911] §3.2.1.1). The
1367 Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client in
1368 the Document Creation operation (see section 4.1).

1369 This attribute may be modified by a client using the Set-Documents-Attributes operation (see section 4.4).

1370 **9.1.20 document-natural-language (naturalLanguage)**

1371 This OPTIONAL Document Description attribute specifies the natural language of the Document Object content. The
1372 Printer sets this Document Description attribute from the corresponding “document-natural-language” Operation
1373 attribute (section 7.2.1 for the semantics), if supplied by the client in the Document Creation operation (see section
1374 4.1). If a Printer supports the “document-natural-language” Operation attribute, the Printer MUST support this
1375 “document-natural-language” Document Description attribute.

1376 **9.1.21 document-number (integer(1:MAX))**

1377 This REQUIRED Document Description attribute is the ordinal number of the document within the job which
1378 determines its order of being printed in a multi-document job. The Printer MUST generate the values monotonically
1379 increasing from 1 for each job.

1380 **9.1.22 document-printer-uri (uri)**

1381 This REQUIRED Document Description attribute is a *copy* of the “printer-uri” Operation attribute (see [rfc2911]
 1382 §3.1.5), i.e., the URI of the Printer containing the Job which contains this Document. Example:
 1383 ipp://www.company.com/printers/myprinter.

1384 **9.1.23 document-state (type1 enum)**

1385 The REQUIRED “document-state” Document Description attributes identifies the current state of the document. The
 1386 values for “document-state” are the same as the values for “job-state”. ([rfc2911] §4.3.7) Even though IPP defines
 1387 five values for document state (plus the out-of-band 'unknown' value - see [rfc2911] section 4.1), implementations
 1388 only need to support those states which are appropriate for the particular implementation. In other words, an IPP
 1389 Printer implementation supports only those document states implemented by the output device and available to the
 1390 IPP Printer implementation. The values ‘pending-held’ and ‘processing-stopped’ do not apply to “document-state”.

1391 Table 12 lists the “document-state” attribute values.

1392 **Table 12 - "document-state" attribute values**

"document-state" Values	
3	pending
5	processing
7	canceled
8	aborted
9	completed

1393

1394 Standard enum values are:

Value	Symbolic Name and Description
'3'	'pending' : The document has not started to be processed at all.
'5'	
	'processing' : One or more of:
	1. The job 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 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 Document is ready for printing, but the output device is not yet printing it, either because the Document hasn't reached the output device or because the Document is queued in the output device or some other spooler, awaiting the output device to print it.
	The ‘processing’ state for the Document indicates that the Document has begun to be processed. Even if the Job stops being processed, the Document remains in the ‘processing’ state until it moves to one of the three terminal states.
	Implementations MAY include additional values in the document’s “document-state-reasons” attribute to indicate the progress of the document, such as adding the ‘printing’ value to indicate when the output device is actually making marks on
'7'	'canceled' : The document has been canceled by a Cancel-Document operation and the

Value	Symbolic Name and Description
	Printer has completed canceling the document and all document status attributes have reached their final values for the document. While the Printer is canceling the document, the document remains in its current state, but the document's "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 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.
'8'	'aborted' : The document has been aborted by the system, usually while the document was in the 'processing' state and the Printer has completed aborting the document and all document status attributes have reached their final values for the document. While the Printer is aborting the document, the document remains in its current state, but the document's "document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values. When the 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.
'9'	'completed' : The document has completed successfully or with warnings or errors after processing and all of the document media sheets have been successfully stacked in the appropriate output bin(s) and all document status attributes have reached their final values for the document. The document's "document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.

1395 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
 1396 document altogether. The length of time that documents remain in the 'canceled', 'aborted', and 'completed' states
 1397 depends on implementation.

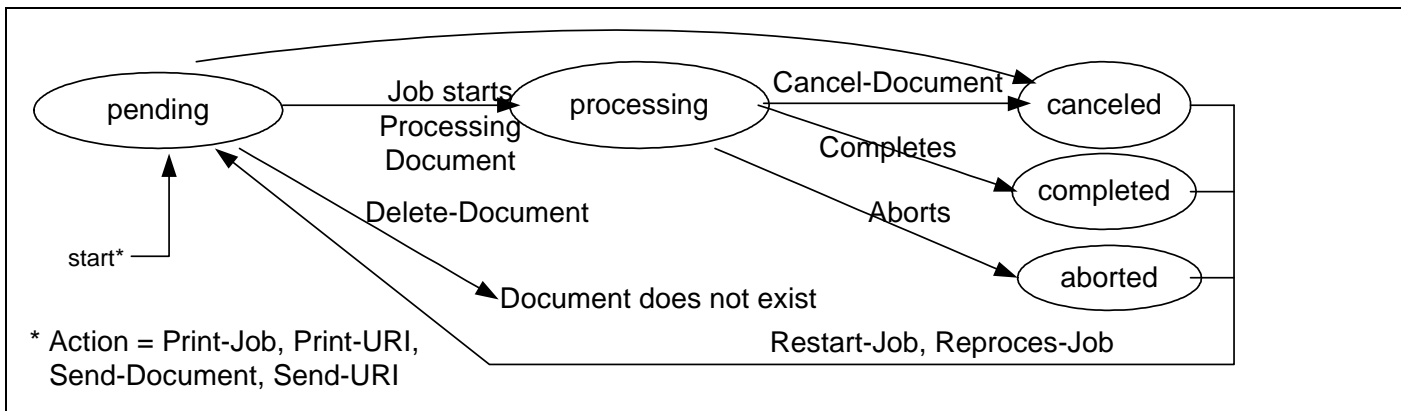
1398 Documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the Job has completed
 1399 all activity for the Document, including stacking output media, and all document status attributes have reached their
 1400 final values for the document.

1401

1402 9.1.23.1 The “document-state” Document Description attribute and the Document object life Cycle

1403 The “document-state” attribute is one of the most important Document Description attributes. Figure 1 shows the
 1404 values of the “document-state” attribute and the Document object life cycle as affected by actions on the Job,
 1405 Document, Printer, and job processing. Documents are not active objects. Active objects in IPP are Printers and
 1406 Jobs. Printers and Jobs have URIs where requests are sent and acted upon. Documents have no such URI.
 1407 Printers schedule Jobs and Jobs, once scheduled, process the Documents that it contains. The Document's life
 1408 cycle is closely tied to the lifecycle of a Job⁵². Documents basically have three states. The first is waiting to be
 1409 processed by a Job (i.e. pending). The second state is from the time the Job first starts processing the Document
 1410 (i.e., processing) and until it reaches one of its terminal states. The third state for a Document is one of its terminal
 1411 states (i.e., completed, canceled, or aborted).

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



1412

1413 **Figure 1 - The "document-state" Document Description attribute and the Document object life cycle**

1414 A Document object has a much simpler life cycle than a Job object. A Document always progresses from left to right
1415 in the state diagram. No other state transitions are defined.

1416 **9.1.24 document-state-message (text(MAX))**

1417 This OPTIONAL Document Description attribute specifies information about the " document-state" and " document-
1418 state-reasons" attributes in human readable text. If the Printer supports this attribute, the Printer MUST be able to
1419 generate this message in any of the natural languages identified by the Printer's "generated-natural-language-
1420 supported" attribute (see the "attributes-natural-language" Operation attribute specified in [rfc2911] Section 3.1.4.1).

1421 The value SHOULD NOT contain additional information not contained in the values of the "document-state" and
1422 "document-states-reasons" attributes, such as interpreter error information. Otherwise, application programs might
1423 attempt to parse the (localized text). For such additional information such as interpreter errors for application
1424 program consumption or specific document access errors, new attributes with keyword values, needs to be
1425 developed and registered.

1426 **9.1.25 document-state-reasons (1setOf type2 keyword)**

1427 The REQUIRED "document-state-reasons" Document Description attributes provide additional information about
1428 each document's current state, i.e., information that augments the value of the Document's "document-state"
1429 attribute.

1430 These values MAY be used with any document state for which the reason makes sense. Some of these value
1431 definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when implemented, the Printer
1432 MUST return these values when the reason applies and MUST NOT return them when the reason no longer applies
1433 whether the value of the Document's "document-state" attribute changed or not. When the Document does not have
1434 any reasons for being in its current state, the value of the Document's "document-state-reasons" attribute MUST be
1435 'none'.

1436 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1437 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1438 objects are passive objects operated on by the containing Job object.

1439 Note: While values cannot be added to the "document-state" attributes without impacting deployed clients that take
1440 actions upon receiving "document-state" values, it is the intent that additional "document-state-reasons" values can
1441 be defined and registered without impacting such deployed clients. In other words, the "document-state-reasons"
1442 attributes are intended to be extensible.

1443 Table 13 lists the standard keyword values for the “document-state-reasons” attributes defined in this specification
 1444 and derived from “job-state-reasons” defined in other IPP specifications as indicated in the References column. In
 1445 Table 13 the keywords are listed in alphabetic order, while in their descriptions following Table 13, they are listed in
 1446 the most likely order of occurrence to help understanding.

1447 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
 1448 level “job-state-reasons”, so that clients that do not support the Document object will receive the same information.
 1449 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
 1450 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
 1451 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

1452 **Table 13 - "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] §6.1
	digital-signature-type-not-supported	MAY	[jobx] §6.1
	document-access-error	MAY	[rfc2911] §4.3.8
	document-format-error	MAY	[rfc2911] §4.3.8
	canceled-at-device	MAY	[rfc2911] §4.3.8 *
	canceled-by-operator	MAY	[rfc2911] §4.3.8 *
	canceled-by-user	MAY	[rfc2911] §4.3.8 *
	completed-successfully	MAY	[rfc2911] §4.3.8 *
	completed-with-errors	MAY	[rfc2911] §4.3.8 *
	completed-with-warnings	MAY	[rfc2911] §4.3.8 *
	data-insufficient	MAY	[rfc2911] §4.3.8 *
	digital-signature-wait	MAY	[jobx] §6.1 *
	errors-detected	MAY	[jobx] §6.1 *
	incoming	MAY	[rfc2911] §4.3.8 *
	interpreting	MAY	[rfc2911] §4.3.8 *
	none	MUST	[rfc2911] §4.3.8
	outgoing	MAY	[rfc2911] §4.3.8 *
	printing	MAY	[rfc2911] §4.3.8 *
	processing-to-stop-point	MAY	[rfc2911] §4.3.8
	queued	MAY	[rfc2911] §4.3.8 *
	queued-for-marker	MAY	[rfc2911] §4.3.8 *
	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
	spooling	MAY	[ippsave] §8.3.1 *
	streaming	MAY	[ippsave] §8.3.1 *
	submission-interrupted	MAY	[rfc2911] §4.3.8
	transforming	MAY	[rfc2911] §4.3.8 *
	unsupported-compression	MUST	[rfc2911] §4.3.8
	unsupported-document-format	MUST	[rfc2911] §4.3.8
	warnings-detected	MAY	[jobx] §6.1 *

1453 * The state reason keyword value is derived from an existing "job-state-reason" value. The associated value is
 1454 prefixed by 'job-' when it is a value of the "job-state-reasons" attribute⁵³. The semantics for the reasons differ
 1455 only by the object to which they are bound. For example 'job-printing' means that at least one document in
 1456 the job is printing i.e. the job is printing, while 'printing' means the document within the job is printing.

1457
 1458 For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely
 1459 to occur (if implemented), starting with the 'none' value. :

1460 **'none'** : There are no reasons for the document's current state. This state reason is semantically equivalent
 1461 to "document-state-reasons" attribute without any value and MUST be used when there is no other
 1462 value, since the 1setOf attribute syntax requires at least one value. [rfc2911] §4.3.8

1463 **jobx'resources-are-not-supported'** : At least one of the resources needed by the document, such as media,
 1464 fonts, resource objects, etc., is not supported on any of the physical printers for which the document
 1465 is a candidate. This condition MAY be detected when the document is accepted, or subsequently
 1466 while the document is pending or processing, depending on implementation. The job containing the
 1467 document may (1) remain in its current state, (2) be moved to the 'pending-held' state, depending on
 1468 implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer is put into the
 1469 'stopped' state when the document is attempted to be processed on the Printer. This value is
 1470 intended for use with an implementation that supports the "user-defined-values-supported" Printer
 1471 attribute (see [pwg5100.3] section 6.1), which allows a job to be accepted with an unsupported
 1472 'name' value. [pwg5100.3] §6.1

1473 **'resources-are-not-ready'** : At least one of the resources needed by the document, such as media, fonts,
 1474 resource objects, etc., is not ready on any of the physical printer's for which the document is a
 1475 candidate. This condition MAY be detected when the document is accepted, or subsequently while
 1476 the document is pending or processing, depending on implementation. The job containing the
 1477 document may remain in its current state or be moved to the 'pending-held' state, depending on
 1478 implementation and/or scheduling policy. [rfc2911] §4.3.8

1479 **'digital-signature-type-not-supported'**: The Job contains a digital signature type that is not supported.
 1480 Implementation or site policy determines the state of the Job once this condition is detected. [jobx] §
 1481 6.1.

1482 **'incoming'** : The Printer is retrieving/accepting document data as a result of a Print-Job, Print-URI, Send-
 1483 Document or Send-URI operation. [rfc2911] §4.3.8

1484 **'spooling'** : Same as '-incoming' with the specialization that the Printer is spooling the Document data before
 1485 processing it. This value corresponds to the 'spool' or 'automatic' value of the "job-spooling-
 1486 supported" Printer Description attribute. [ippsave] §8.3.1

1487 **'streaming'** : Same as 'incoming' with the specialization that the Printer is processing the Document data as
 1488 it is being received (that is, the document is not being spooled, but rather is being processed in
 1489 chunks by the output device and is being imaged during reception). This value corresponds to the
 1490 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description attribute. [ippsave]
 1491 §8.3.1

1492 **'data-insufficient'** : The Printer is expecting additional document data before it can move the document into
 1493 the 'processing' state. If a Printer starts processing before it has received all data, the Printer
 1494 removes the 'data-insufficient' reason, but the 'incoming' remains. If a Printer starts processing after
 1495 it has received all data, the Printer removes the 'data-insufficient' reason and the 'incoming' at the
 1496 same time. [rfc2911] §4.3.8

1497 **'unsupported-compression'** : The document was aborted by the system because the Printer determined
 1498 while attempting to decompress the document-data's that the compression is actually not among

⁵³ 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.

- 1499 those supported by the Printer. This value MUST be supported, since "compressions is a
1500 REQUIRED Operation attribute. [rfc2911] §4.3.8
- 1501 **'compression-error'** : The document was aborted by the system because the Printer encountered an error
1502 in the document-data while decompressing it. If the Printer posts this reason, the document-data
1503 has already passed any tests that would have led to the 'unsupported-compression' job-state-
1504 reason/document-state-reason. [rfc2911] §4.3.8
- 1505 **'document-access-error'** : After accepting a Print-URI or Send-URI request, the Printer could not access
1506 the documents reference. This reason is intended to cover any file access problem, including file
1507 does not exist and access denied because of an access control problem. The Printer MAY also
1508 indicate the document access error using the " document-access-errors" Printer Description attribute
1509 Whether the Printer aborts the document and moves the document to the 'aborted' job state or prints
1510 all documents that are accessible and moves the document to the 'completed' document state and
1511 adds the 'completed-with-errors' value in the job's "job-state-reasons" or document's "document-
1512 state-reasons" attribute depends on implementation and/or site policy. This value SHOULD be
1513 supported if the Print-URI or Send-URI operations are supported. [rfc2911] §4.3.8
- 1514 **'unsupported-document-format'** : The document was aborted by the system because the document-data's
1515 document-format is not among those supported by the Printer. If the client specifies the document-
1516 format as 'application/octet-stream', the printer MAY abort the document and post this reason even
1517 though the format is a member of the "document-format-supported" printer attribute, but not among
1518 the auto-sensed document-formats. This value MUST be supported, since "document-format" is a
1519 REQUIRED Operation attribute. [rfc2911] §4.3.8
- 1520 **'document-format-error'** : The document was aborted by the system because the Printer encountered an
1521 error in the document-data while processing it. If the Printer posts this reason, the document-data
1522 has already passed any tests that would have led to the 'unsupported-document-format' job-state-
1523 reason/document-state-reason. [rfc2911] §4.3.8
- 1524 **'submission-interrupted'** : The document was not completely submitted for some unforeseen reason, such
1525 as: (1) the Printer has crashed before the document was closed by the client, (2) the Printer or the
1526 document transfer method has crashed in some non-recoverable way before the document data was
1527 entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-out
1528 period. See the description of the "multiple-operation-time-out" Printer attribute in [rfc2911] Section
1529 4.4.31. [rfc2911] §4.3.8
- 1530 **'digital-signature-wait'**: The Job is currently being held because the Job was submitted with a "document-
1531 digital-signature" attribute value that is not supported. The operator MAY either cancel the job or
1532 release it to be processed. [jobx] § 6.1.
- 1533 **'outgoing'** : The Printer is transmitting the document to the output device. [rfc2911] §4.3.8
- 1534 **'queued'** : Document is in the 'processing' state, but more specifically, the Printer has queued the Document
1535 data. [rfc2911] §4.3.8
- 1536 **'transforming'** : Document is in the 'processing' state, but more specifically, the Printer is interpreting
1537 document data and producing another electronic representation. [ippsave] §8.3.1
- 1538 **'interpreting'** : Document is in the 'processing' state, but more specifically, the Printer is interpreting the
1539 document data. [rfc2911] §4.3.8
- 1540 **'queued-for-marker'** : Document is in the 'pending', or 'processing' states, but more specifically, the Printer
1541 has completed enough processing of the document to be able to start marking and the document is
1542 waiting for the marker. All implementations put the document into (or back into) the 'processing'
1543 state when marking does begin. rfc2911] §4.3.8
- 1544 **'printing'** : The output device is marking media. This value is useful for Printers which spend a great deal of
1545 time processing (1) when no marking is happening and then want to show that marking is now
1546 happening or (2) when the document is in the process of being canceled or aborted while the

- 1547 document remains in the 'processing' state, but the marking has not yet stopped so that impression
1548 or sheet counts are still increasing for the document. [rfc2911] §4.3.8
- 1549 **'digital-signature-did-not-verify'** : The Document contains a digital signature type that is supported but the
1550 signature did not verify when the Printer attempted to verify the signature. [jobx] §6.1
- 1551 **'canceled-by-user'** : The document was canceled by the owner of the job using the Cancel-Document
1552 request, i.e., by a user whose authenticated identity is the same as the value of the originating user
1553 that created the Job object, or by some other authorized end-user, such as a member of the job
1554 owner's security group. The 'canceled-by-user' value SHOULD be supported for the "document-
1555 state-reasons" attributes for use with the Cancel-Document. [rfc2911] §4.3.8
- 1556 **'canceled-by-operator'** : The document was canceled by the operator using the Cancel-Document request,
1557 i.e., by a user who has been authenticated as having operator privileges (whether local or remote). If
1558 the security policy is to allow anyone to cancel anyone's document, then these values may be used
1559 when the document is canceled by other than the owner of the job. For such a security policy, in
1560 effect, everyone is an operator as far as canceling documents is concerned. These values SHOULD
1561 be supported if the implementation permits canceling by other than the owner of the job. [rfc2911]
1562 §4.3.8
- 1563 **'canceled-at-device'** : The document was canceled by an unidentified local user, i.e., a user at a console at
1564 the device. This value SHOULD be supported if the implementation supports canceling
1565 jobs/documents at the console. [rfc2911] §4.3.8
- 1566 **'aborted-by-system'** : The document (1) is in the process of being aborted, or (2) has been aborted by the
1567 system and placed in the 'aborted' state.. This value SHOULD be supported. [rfc2911] §4.3.8
- 1568 **'processing-to-stop-point'** : The requester has issued a Cancel-Document operation or the Printer has
1569 aborted the document, but is still performing some actions on the document until a specified stop
1570 point occurs or document termination/cleanup is completed.
1571 If the implementation requires some measurable time to cancel the document in the 'processing' or
1572 'processing-stopped' document states, the Printer MUST use this value to indicate that the Printer is
1573 still performing some actions on the document while the document remains in the 'processing' state.
1574 After all the document's document description attributes have stopped incrementing, the Printer
1575 moves the document from the 'processing' state to the 'canceled' or 'aborted' document states.
1576 [rfc2911] §4.3.8
- 1577 **'errors-detected'** : If the Printer supports these values, the Printer MUST add the value to "document-state-
1578 reasons" when it generates the first error message. That is, a single occurrence of this value is
1579 present in the "document-state-reasons" if the Printer has generated one or more errors. An error
1580 indicates loss of information, such as a page not imaged. A warning indicates no loss of information
1581 (see 'warnings-detected' state reason). [jobx] §6.1
- 1582 **'warnings-detected'** : If the Printer supports these values, the Printer MUST add the value to "document-
1583 state-reasons" when it generates the first warning message. That is, a single occurrence of this value
1584 is present in the "document-state-reasons" if the Printer has generated one or more warnings. A
1585 warning indicates something did not go as expected, but there was no loss of information. For
1586 example, a font substitution. An error indicates loss of information (see 'errors-detected' state
1587 reason). [jobx] §6.1
- 1588 **'completed-successfully'** : The document completed successfully. There were no warnings or errors in
1589 printing. This value SHOULD be supported. [rfc2911] §4.3.8
- 1590 **'completed-with-warnings'** : The print part of the document completed with warnings (whether or not there
1591 were save errors). This value SHOULD be supported if the implementation detects warnings.
1592 [rfc2911] §4.3.8
- 1593 **'completed-with-errors'** : The print part of the document completed with errors (and possibly warnings too)
1594 (whether or not there were save errors). This value SHOULD be supported if the implementation
1595 detects errors. [rfc2911] §4.3.8

1596 **'queued-in-device'** : The document has been forwarded to a device or print system that is unable to send
1597 back status. The Printer sets the document's "document-state" attribute to 'completed' and adds the
1598 'queued-in-device' value to the document's " document-state-reasons" attribute to indicate that the
1599 Printer has no additional information about the document and never will have any better information.
1600 See the description of the " document-state" attribute above, specifically the portion on "Forwarding
1601 Servers". [rfc2911] §4.3.8

1602 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1603 **9.1.26 document-uri (uri)**

1604 This Document Description attribute is the URI that the client supplied in the corresponding Operation attribute in a
1605 Send-URI operation (see [rfc2911] section 3.3.2). The Printer MUST support this attribute if the Printer supports the
1606 Send-URI operation (see section 4.2).

1607 Note: this URI identifies the source location of the document data. This URI is NOT the identifier of the Document
1608 Object. The simple identifier of the Document is the "document-number".

1609 **9.1.27 impressions-completed-current-copy (integer(0:MAX))**

1610 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1611 attribute (see [rfc3381] §4.4) applied to the Document object.

1612 **9.1.28 detailed-status-message (1setOf text(MAX))**

1613 This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the
1614 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] job-detailed-status-message
1615 §4.3.10) applied to the Document object.

1616 **9.1.29 document-access-errors (1setOf text(MAX))**

1617 This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the
1618 corresponding "job-detailed-status-message" Job Description attribute (see [rfc2911] job-document-access-errors
1619 §4.3.11) applied to the Document object.

1620 **9.1.30 errors-count (integer(0:MAX))**

1621 This OPTIONAL "errors-count" Document Description attribute counts the number of errors that the Printer
1622 encounters while processing and printing the Document object. An error indicates loss of information, such as a
1623 page not imaged. A warning indicates no loss of information (see [jobx] job-errors-count §5.2)

1624 **9.1.31 impressions (integer(0:MAX))**

1625 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
1626 impressions" Job Description attribute (see [rfc2911] job-impressions §4.3.17.2) applied to the Document object.
1627 The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client
1628 in the Document Creation operation (see §4).

1629 **9.1.32 impressions-completed (integer(0:MAX))**

1630 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the
1631 corresponding "job-impressions-completed" Job Description attribute (see [rfc2911] job-impressions-completes
1632 §4.3.18.2) applied to the Document object.

1633 **9.1.33 k-octets (integer(0:MAX))**

1634 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-
1635 octets" Job Description attribute (see [rfc2911] job-k-octets §4.3.17.1) applied to the Document object. The Printer
1636 sets this Document Description attribute from the corresponding Operation attribute supplied by the client in the
1637 Document Creation operation (see §4

1638 **9.1.34 k-octets-processed (integer(0:MAX))**

1639 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding
1640 "job-k-octets-processed" Job Description attribute (see [rfc2911] job-k-octets-processed §4.3.18.1) applied to the
1641 Document object.

1642 **9.1.35 media-sheets (integer(0:MAX))**

1643 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
1644 media-sheets" Job Description attribute (see [rfc2911] job-media-sheets §4.3.17.3) applied to the Document object.
1645 The Printer sets this Document Description attribute from the corresponding Operation attribute supplied by the client
1646 in the Document Creation operation (see §4).

1647 **9.1.36 media-sheets-completed (integer(0:MAX))**

1648 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
1649 media-sheets-completed" Job Description attribute (see [rfc2911] job-media-sheets-completed 4.3.18.3) applied to
1650 the Document object.

1651 **9.1.37 more-info (uri)**

1652 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-
1653 more-info" Job Description attribute (see [rfc2911] job-more-info §4.3.4) applied to the Document object.

1654 **9.1.38 printer-up-time (integer (1:MAX))**

1655 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the
1656 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description
1657 attribute (see [rfc2911] job-printer-up-time section 4.4.29).

1658 A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value
1659 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes
1660 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of
1661 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-
1662 xxx" event occurred by subtracting this difference from the client's wall-clock time.

1663 **9.1.39 warnings-count (integer(0:MAX))**

1664 This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding
1665 "job-warnings-count" Job Description attribute (see [jobx] job-warnings-count §5,4) applied to the Document object.
1666 .A warning indicates something did not go as expected, but there was no loss of information. For example, a font
1667 substitution. An error indicates loss of information (see section 9.1.30).

1668 **9.1.40 last-document (boolean)**

1669 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the
1670 Job. See [rfc2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding Operation
1671 attribute supplied by the client in the Document Creation operation (see §4).

1672 **9.1.41 output-device-assigned (name(127))**

1673 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1674 attribute (see [rfc2911] §4.3.7.2) applied to the Document object.

1675 **9.1.42 sheet-completed-copy-number (integer(0:MAX))**

1676 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1677 attribute (see [rfc3381] §4.2) applied to the Document object.

1678 **9.1.43 time-at-completed (integer (MIN:MAX))**

1679 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1680 attribute (see [rfc2911] §4.3.14.3) applied to the Document object.

1681 **9.1.44 time-at-creation (integer (MIN:MAX))**

1682 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1683 attribute (see [rfc2911] §4.3.14.1) applied to the Document object.

1684 **9.1.45 time-at-processing (integer (MIN:MAX))**

1685 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1686 attribute (see [rfc2911] §4.3.14.2) applied to the Document object.

1687 **10 Printer attributes**

1688 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three
1689 disjoint groups:
1690

Job Template attributes (JT)	<p>These Printer attributes are related directly to the “xxx” Job Template attributes 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”. These Printer attributes are also returned in a Get-Printer-Attributes response when the client supplies: “requested-attributes” = ‘document-template’.
Printer Description attributes (PD)	These Printer attributes describe the Printer, such as “printer-name” and “printer-location”. Some of them are “xxx-supported” and “xxx-default” for Operation attributes that the client can supply in a Job Creation request.
neither (-)	These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.

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

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“**Attribute Syntax**” - indicates the attribute syntax (see [rfc2911] section 4.1). Many “xxx-default” and “xxx-supported” attributes have the ‘collection’ syntax which consists of a number of member attributes. These member attributes are not listed in this table when they are the same as the corresponding “xxx” attribute in Table 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
charset-configured	charset	PD	MUST	[rfc2911] §4.4.17
charset-supported	1 setOf 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	1 setOf 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	1 setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.1.4
cover-type-supported	1 setOf type2 keyword	-	MAY	[pwg5100.3] §3.1.2.1
document-charset-default	charset	PD	CMUST ⁵⁴	[jobx] §7.1
document-charset-supported	1 setOf charset	PD	CMUST ⁵⁴	[jobx] §7.2

⁵⁴ 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 [jobx] §3.2.1).

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
document-creation-attributes-supported	1 setOf type2 keyword	PD	MUST	[this-spec] §10.1
document-digital-signature-default	type2 keyword	PD	MAY	[jobx] §7.3
document-digital-signature-supported	1 setOf type2 keyword	PD	MAY	[jobx] §7.4
document-format-default	mimeMediaType	PD	MUST	[rfc2911] §4.4.21
document-format-details-supported	1 setOf type2 keyword	PD	CMUST ⁵⁵	[jobx] §7.6
document-format-details-implemented	1 setOf collection	PD	CMUST ⁵⁵	[jobx] §7.7
document-format-supported	1 setOf mimeMediaType	PD	MUST	[rfc2911] §4.4.22
document-format-varying-attributes	1 setOf type2 keyword	PD	MAY	[rfc3380] §6.3
document-format-version-default	text(127)	PD	MAY	[jobx] §7.8
document-format-version-supported	1 setOf text(127)	PD	MAY	[jobx] §7.9
document-natural-language-default	naturalLanguage	PD	MAY	[jobx] §7.10
document-natural-language-supported	1 setOf naturalLanguage	PD	MAY	[jobx] §7.11
feed-orientation-default	type3 keyword	JT,DT	MAY	[ippsave] §5.1.1
feed-orientation-supported	1 setOf type3 keyword	JT,DT	MAY	[ippsave] §5.1.2
finishings-col-default	collection	JT,DT	MAY	[pwg5100.3] §3.2.3
finishings-col-ready	1 setOf collection	JT,DT	MAY	[pwg5100.3] §3.2.4
finishings-col-supported	1 setOf type2 keyword	JT,DT	MAY	[pwg5100.3] §3.2.5
finishings-default	1 setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishings-ready	1 setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishings-supported	1 setOf type2 enum	JT,DT	MAY	[rfc2911] §4.2.6
finishing-template-supported	1 setOf name(MAX)	-	MAY	[pwg5100.3] §3.2.1.1
font-name-requested-default	name(MAX)	JT,DT	MAY	[ippsave] §5.2.1
font-name-requested-supported	1 setOf 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	1 setOf integer (1:MAX)	JT,DT	MAY	[ippsave] §5.3.1
force-front-side-default	1 setOf 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	1 setOf naturalLanguage	PD	MUST	[rfc2911] §4.4.20
imposition-template-default	type3 keyword name(MAX)	JT,DT	MAY	[pwg5100.3] §3.4
imposition-template-supported	1 setOf (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	1 setOf collection	JT,DT	MAY	[pwg5100.3] §3.5.4
insert-sheet-supported	1 setOf 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	1 setOf 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-	1 setOf (type3 keyword	-	MAY	[pwg5100.3] §3.8.3.2

⁵⁵ 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
supported	name(MAX))			
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	[jobx] §4.1.1.1
job-copies-supported	reangeOfInteger(1:MAX)	JT	MAY	[jobx] §4.1.1.2
job-cover-back-default	collection	JT	MAY	[jobx] §4.1.2.1
job-cover-back-supported	1setOf type2 keyword	JT	MAY	[jobx] §4.1.2.2
job-cover-front-default	collection	JT	MAY	[jobx] §4.1.3.1
job-cover-front-supported	1setOf type2 keyword	JT	MAY	[jobx] §4.1.3.2
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	[jobx] §4.1.4.1
job-finishings-supported	1setOf type2 enum	JT	MAY	[jobx] §4.1.4.2
job-finishings-col-default	collection	JT	MAY	[jobx] §4.1.5.1
job-finishings-col-supported	1setOf type2 keyword	JT	MAY	[jobx] §4.1.5.2
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

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
media-col-database <i>any "media-col" member attribute</i>	1 setOf collection	- ⁵⁶	MAY	[ippsave] §7.6
media-col-default <i>any "media-col" member attribute</i>	collection	JT	MAY	[pwg5100.3] §3.13.12
media-color-supported	1 setOf type2 keyword	-	MAY	[pwg5100.3] §3.13.4.1
media-col-ready <i>any "media-col" member attribute</i>	1 setOf collection	JT	MAY	[pwg5100.3] §3.13.13
media-col-supported	1 setOf 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	1 setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.10.1
media-hole-count-supported	1 setOf 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	1 setOf (type3 keyword name(MAX))	JT	MAY	[pwg5100.3] §3.14
media-key-supported	1 setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.1.1
media-order-count-supported	1 setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.7.1
media-pre-printed-supported	1 setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.5.1
media-ready	1 setOf (type3 keyword name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
media-recycled-supported	1 setOf (type3 keyword name(MAX))	-	MAY	[pwg5100.3] §3.13.11.1
media-size-supported	1 setOf collection	-	MAY	[pwg5100.3] §3.13.8.3
media-supported	1 setOf (type3 keyword name(MAX))	JT,DT	MAY	[rfc2911] §4.2.11
media-weight-metric-supported	1 setOf rangeOfInteger(1:MAX)	-	MAY	[pwg5100.3] §3.13.9.1
multiple-document-handling-default	type2 keyword	JT	MUST ⁵⁷	[rfc2911] §4.2.4
multiple-document-handling-supported	1 setOf type2 keyword	JT	MUST ⁵⁷	[rfc2911] §4.2.4
multiple-document-jobs-supported	boolean	PD	MUST ⁵⁷	[rfc2911] §4.4.16
multiple-operation-time-out	integer(1:MAX)	PD	MUST ⁵⁷	[rfc2911] §4.4.31
natural-language-configured	naturalLanguage	PD	MUST	[rfc2911] §4.4.19
notify-attributes-supported	1 setOf type2 keyword	PD	MAY	[ntfy] §5.3.4
notify-events-default	1 setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-events-supported	1 setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-lease-duration-default	integer(0:67108863)	PD	MAY	[ntfy] §5.3.8

⁵⁶ 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.

⁵⁷ A Printer MUST support "multiple-document-handling-default", "multiple-document-handling-supported", "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
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
output-bin-supported	1setOf (type2 keyword name(MAX))	JT	MAY	[pwg5100.2] §2.1
output-device-requested-supported	1setOf name(127)	PD	MAY	[jobx] §7.12
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
overrides-supported	1setOf type2 keyword	JT,DT	MAY	[OvrRide] §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	[Jobx] §4.1.6.2
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 attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
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
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 ⁵⁸	[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

⁵⁸ The Printer MUST support "reference-uri-scheme-supported" Printer Description attribute, since the Send-URI operation is REQUIRED.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
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

1711
 1712 The remainder of this section defines the Printer Description attributes that are not defined in other specifications.
 1713 Most of these are “xxx-default” and “xxx-supported” Printer Description attributes. A Printer MUST support these
 1714 Printer Description attributes, if it supports the corresponding Operation/Description attributes, in order to indicate the
 1715 default and supported values that the Printer supports.

1716 **10.1 document-creation-attributes-supported (1setOf type2 keyword)**

1717 This REQUIRED Printer Description attribute lists the keyword names of the Document Template and Operation
 1718 attributes that the Printer will accept in the Send-Document and Send-URI Document Creation operations.

1719 **11 New Values for Existing Printer Description Attributes**

1720 This section contains those attributes for which additional values are added.

1721 **11.1 operations-supported (1setOf type2 enum)**

1722 The following “operation-id” values are added in order to support the new operations defined in this document:

1723 **Table 15 – 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

1724

1725 **12 Encodings of Additional Attribute Tags**

1726 This section assigns values to an attributes tags as an extension to the encoding defined in [rfc2910].

1727 The “document-attributes-tag” delimits Document Template Attributes Groups in requests and Document Attributes
 1728 Groups in responses.

1729 The following table specifies the values for the delimiter tag:

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

1730

1731 **13 Status codes**

1732 This section defines additional status codes for use with multi-document jobs.

1733 **13.1 server-error-too-many-jobs (0x050B)**

1734 The client has attempted to create a Job using any of the Job Creation operations which would exceed the capacity
1735 of the Printer and/or the policy for this user or type of job. The client SHOULD NOT try again later.

1736 **13.2 server-error-too-many-documents (0x050C)**

1737 The client has attempted to create a Document using any of the Document Creation operations which would exceed
1738 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
1739 later.

1740 **14 Conformance Requirements**

1741 This section specifies the conformance requirements for Printers and clients.

1742 **14.1 Printer conformance requirements**

1743 In order to conform to this specification, a Printer:

- 1744 1. MUST meet the conformance requirements for Printers specified in [rfc2911].
- 1745 2. MUST support the Job operation that section 3 REQUIRES a Printer to support.
- 1746 3. MUST support the Document operations that section 4 REQUIRES a Printer to support.
- 1747 4. MAY support any of the Administrative operations in section 5.
- 1748 5. MUST support the Attribute Precedence semantics specified in section 6 for the levels that the Printer
1749 supports.
- 1750 6. MUST support the Operation attributes in the Send-Document operation and, if supported, the Send-URI
1751 operation that section 7 REQUIRES a Printer to support.
- 1752 7. MUST support any Operation attributes that section 7 REQUIRES a Printer to support along with the
1753 corresponding Document Description attributes that section 8.2 REQUIRES a Printer to support and any
1754 "xxx-default" and "xxx-supported" Printer attributes that section 10 REQUIRES a Printer to support.
- 1755 8. MAY support any of the Document Template attributes in Document Creation operations as indicated in
1756 section 8 and MUST NOT support them for contexts for where they are not defined as indicated in the
1757 Table 11 with an "-".
- 1758 9. MUST support the Document Description attributes that section 8.2 REQUIRES a Printer to support.
- 1759 10. MUST support the Printer attributes that section 10 REQUIRES a Printer to support.

1760 11. MUST support the values of Printer Description attributes that section 11 REQUIRES a Printer to
1761 support.

1762 14.2 Client conformance requirements

1763 In order to conform to this specification, a client:

- 1764 1. MUST meet the conformance requirements for clients specified in [rfc2911]
- 1765 2. MAY support any of the Document operations defined in section 3.7.
- 1766 3. MUST supply the Operation attributes that section 7 REQUIRES a client to supply in operation requests.
- 1767 4. MUST supply any Document Template attributes in the format that section 8 REQUIRES a client to supply in
1768 Document Creation operations and MUST NOT support them for contexts for where they are not defined as
1769 indicated in the Table 11 with an "n".
- 1770 5. SHOULD support any of the Document Description attributes that section 8.2 REQUIRES a Printer to support.
- 1771 6. MAY support any of the Printer attributes listed in section 10.
- 1772 7. MAY support any of the values of the Printer Descriptions attributes in section 11.

1773 15 Normative References

1774 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
1775 below, rather than the RFC number (except for [rfc2910] and [rfc2911]). IETF RFCs and IANA registrations require
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1891 **17 IANA Considerations**

1892 This section contains the registration information for IANA to add to the various IPP Registries according to the
1893 procedures defined in RFC 2911 [rfc2911] section 6 to cover the definitions in this document. The resulting
1894 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations-registry>.

1895 *Note to the RFC Editor: Replace the References below to [this spec] with the RFC number for the appropriate*
1896 *document, so that it accurately reflects the content of the information for the IANA Registry.*

1897 **17.1 Attribute Registrations**

1898 The following table lists all the attributes defined in this specification. These are to be registered according to the
 1899 procedures in RFC 2911 [rfc2911] section 6.2. If the attribute has a separate sub-section definition in this
 1900 specification, that sub-section is listed as the Reference. This specification lists most Job Template attributes as also
 1901 being Document Template attributes. However, the definitions of these Document Template attributes are not
 1902 duplicated in this specification. Instead, the Reference column in this sub-section indicates Section 8 which contains
 1903 a table of all Job Template and corresponding Document Template attributes (including dropping the "job-" prefix).
 1904 This table contains the reference in another specification that completely defines each attribute. These Document
 1905 Template attributes will also be added to the IANA IPP Registry under the Document Template attributes with a
 1906 reference to this specification and Section 8.
 1907

1908	Attribute Name (attribute syntax)	Reference	Section
1909	-----	-----	-----
1910	Document Description attributes:		
1911	attributes-charset (charset)	[this spec]	9.1.1
1912	attributes-natural-language (naturalLanguage)	[this spec]	9.1.2
1913	compression (type3 keyword)	[this spec]	9.1.3
1914	current-page-order (type2 keyword)	[this spec]	9.1.4
1915	date-time-at-completed (dateTime)	[this spec]	9.1.5
1916	date-time-at-creation (dateTime)	[this spec]	9.1.6
1917	date-time-at-processing (dateTime)	[this spec]	9.1.7
1918	detailed-status-message (1setOf text (MAX))	[this spec]	9.1.28
1919	document-access-errors (1setOf text(MAX))	[this spec]	9.1.29
1920	document-charset (charset)	[this spec]	9.1.8
1921	document-digital-signature (type2 keyword)	[this spec]	9.1.9
1922	document-format (mimeMediaType)	[this spec]	9.1.8
1923	document-format-details (collection)	[this spec]	9.1.11
1924			
1925	document-format-details-detected (1setOf collection)		
1926		[this spec]	9.1.12
1927	document-format-detected (mimeMediaType)	[this spec]	9.1.13
1928	document-format-version (text(127))	[this spec]	9.1.14
1929	document-format-version-detected (text(127))	[this spec]	9.1.15
1930	document-job-id (integer(1:MAX))	[this spec]	9.1.11
1931	document-job-uri (uri)	[this spec]	9.1.17
1932	document-message (text(MAX))	[this spec]	9.1.18
1933	document-name (name(MAX))	[this spec]	9.1.19
1934	document-natural-language (naturalLanguage)	[this spec]	9.1.20
1935	document-number (integer(0:MAX))	[this spec]	9.1.21
1936	document-printer-uri (uri)	[this spec]	9.1.22
1937	document-state (type1 enum)	[this spec]	9.1.23
1938	document-state-message (text(MAX))	[this spec]	9.1.24
1939	document-state-reasons (1setOf type2 keyword)	[this spec]	9.1.25
1940	document-uri (uri)	[this spec]	9.1.26
1941	impressions (integer(0:MAX))	[this spec]	9.1.31
1942	impressions-completed (integer(0:MAX))	[this spec]	9.1.32
1943	impressions-completed-current-copy (integer(0:MAX))		

1944		[this spec]	9.1.27
1945	k-octets (integer(0:MAX))	[this spec]	9.1.33
1946	k-octets-processed (integer(0:MAX))	[this spec]	9.1.34
1947	last-document (boolean)	[this spec]	9.1.39
1948	media-sheets (integer(0:MAX))	[this spec]	9.1.35
1949	media-sheets-completed (integer(0:MAX))	[this spec]	9.1.36
1950	more-info (uri)	[this spec]	9.1.37
1951	output-device-assigned (name(127))	[this spec]	9.1.41
1952	printer-up-time (integer (1:MAX))	[this spec]	9.1.38
1953	sheet-completed-copy-number (integer(0:MAX))	[this spec]	9.1.42
1954	time-at-completed (integer (MIN:MAX))	[this spec]	9.1.43
1955	time-at-creation (integer (MIN:MAX))	[this spec]	9.1.44
1956	time-at-processing (integer (MIN:MAX))	[this spec]	9.1.45
1957			
1958			
1959	Document Templates attributes:		
1960	copies (integer(1:MAX))	[this spec]	8
1961	copies-default (integer(1:MAX))	[this spec]	8
1962	copies-supported (integer(1:MAX))	[this spec]	8
1963	cover-back (collection)	[this spec]	8
1964	cover-type (type2 keyword)	[this spec]	8
1965	media (type3 keyword name(MAX))	[this spec]	8
1966	media-col (collection)	[this spec]	8
1967	cover-back-default (collection)	[this spec]	8
1968	cover-back-supported (1setOf type2 keyword)	[this spec]	8
1969	cover-front (collection)	[this spec]	8
1970	cover-type (type2 keyword)	[this spec]	8
1971	media (type3 keyword name(MAX))	[this spec]	8
1972	media-col (collection)	[this spec]	8
1973	cover-front-default (collection)	[this spec]	8
1974	cover-front-supported (1setOf type2 keyword)	[this spec]	8
1975	feed-orientation (type3 keyword)	[this spec]	8
1976	feed-orientation-default (type3 keyword)	[this spec]	8
1977	feed-orientation-supported (1setOf type3 keyword)	[this spec]	8
1978	finishings (1setOf type2 enum)	[this spec]	8
1979	finishings-default (1setOf type2 enum)	[this spec]	8
1980	finishings-supported (1setOf type2 enum)	[this spec]	8
1981	finishings-col (collection)	[this spec]	8
1982	finishing-template (name(MAX))	[this spec]	8
1983	stitching (collection)	[this spec]	8
1984	stitching-locations (1setOf integer(0:MAX))	[this spec]	8
1985	stitching-offset (integer (0:MAX))	[this spec]	8
1986	stitching-reference-edge (type2 keyword)	[this spec]	8
1987	finishings-col-default (collection)	[this spec]	8
1988	finishings-col-supported (1setOf type2 keyword)	[this spec]	8
1989	font-name-requested (name(MAX))	[this spec]	8

1990	font-name-requested-default (name(MAX))	[this spec]	8
1991	font-name-requested-supported (1setOfname(MAX))	[this spec]	8
1992	font-size-requested (integer(1:MAX))	[this spec]	8
1993	font-size-requested-default (name(MAX))	[this spec]	8
1994	font-size-requested-supported (1setOfname(MAX))	[this spec]	8
1995	force-front-side (1setOf integer(1:MAX))	[this spec]	8
1996	force-front-side (1setOf integer(1:MAX))	[this spec]	8
1997	force-front-side (rangeOfInteger(1:MAX))	[this spec]	8
1998	imposition-template (type3 keyword name(MAX))	[this spec]	8
1999	imposition-template-default (type3 keyword name(MAX))		
2000		[this spec]	8
2001	imposition-template-supported (1setOf type3 keyword name(MAX))		
2002		[this spec]	8
2003	insert-sheet (1setOf collection)	[this spec]	8
2004	insert-after-page-number (integer(0:MAX))	[this spec]	8
2005	insert-count (integer(0:MAX))	[this spec]	8
2006	media (type3 keyword name(MAX))	[this spec]	8
2007	media-col (collection)	[this spec]	8
2008	insert-sheet-default (1setOf collection)	[this spec]	8
2009	insert-sheet-supported (1setOf type2 keyword)	[this spec]	8
2010	media (type3 keyword name(MAX))	[this spec]	8
2011	media-default (type3 keyword name(MAX))	[this spec]	8
2012	media-supported (1setOf type3 keyword name(MAX))	[this spec]	8
2013	media-col (collection)	[this spec]	8
2014	media-back-coating (type3 keyword name(MAX))	[this spec]	8
2015	media-color (type3 keyword name(MAX))	[this spec]	8
2016	media-front-coating (type3 keyword name(MAX))	[this spec]	8
2017	media-hole-count (integer(0:MAX))	[this spec]	8
2018	media-info (text(255))	[this spec]	8
2019	media-key (type3 keyword name(MAX))	[this spec]	8
2020	media-order-count (integer(1:MAX))	[this spec]	8
2021	media-preprinted (type3 keyword name(MAX))	[this spec]	8
2022	media-recycled (type3 keyword name(MAX))	[this spec]	8
2023	media-size (collection)	[this spec]	8
2024	x-dimension (integer(0:MAX))	[this spec]	8
2025	y-dimension (integer(0:MAX))	[this spec]	8
2026	media-type (type3 keyword name(MAX))	[this spec]	8
2027	media-weight-metric (integer(0:MAX))	[this spec]	8
2028	media-col-default (collection)	[this spec]	8
2029	media-col-supported (1setOf type2 keyword)	[this spec]	8
2030	media-input-tray-check (type3 keyword name(MAX))		
2031		[this spec]	8
2032	media-input-tray-check-default (type3 keyword name(MAX))		
2033		[this spec]	8
2034	media-input-tray-check-supported (1setOf type3 keyword name(MAX))		
2035		[this spec]	8

2036	number-up (integer(1:MAX))	[this spec]	8
2037	number-up-default (integer(1:MAX))	[this spec]	8
2038	number-up-supported (1setOfinteger(1:MAX))	RangeOfInteger (1:MAX)	
2039		[this spec]	8
2040	orientation-requested (type2 enum)	[this spec]	8
2041	orientation-requested-default (type2 enum)	[this spec]	8
2042	orientation-requested-supported (1setOf type2 enum)	[this spec]	8
2043	output-bin (type2 keyword name(MAX))	[this spec]	8
2044	output-bin-default (type2 keyword name(MAX))	[this spec]	8
2045	output-bin-supported (1setOf type2 keyword name(MAX))		
2046		[this spec]	8
2047	page-delivery (type2 keyword)	[this spec]	8
2048	page-delivery-default (type2 keyword)	[this spec]	8
2049	page-delivery-supported (1setOf type2 keyword)	[this spec]	8
2050	page-order-received (type2 keyword)	[this spec]	8
2051	page-order-received-default (type2 keyword)	[this spec]	8
2052	page-order-received-supported (1setOf type2 keyword)		
2053		[this spec]	8
2054	overrides (1setOf collection)	[this spec]	8
2055	pages (1setOf rangeOfInteger(MAX))	[this spec]	8
2056	document-numbers (1setOf rangeOfInteger(MAX))	[this spec]	8
2057	document-copies (1setOf rangeOfInteger(MAX))	[this spec]	8
2058	<any other Job Template attributes that affect pages,		
2059	such as media or media-col>		
2060	overrides-supported (1setOf type2 keyword)	[this spec]	8
2061	page-ranges (1setOf rangeOfInteger(1:MAX))	[this spec]	8
2062	page-ranges-supported (boolean)	[this spec]	8
2063	pages-per-subset (1setOf integer(1:MAX))	[this spec]	8
2064	pages-per-subset-supported (boolean)	[this spec]	8
2065	presentation-direction-number-up (type2 keyword)	[this spec]	8
2066	presentation-direction-number-up-default (type2 keyword)		
2067		[this spec]	8
2068	presentation-direction-number-up-supported (1setOf type2 keyword)		
2069		[this spec]	8
2070	print-quality (type2 enum)	[this spec]	8
2071	print-quality-default (type2 enum)	[this spec]	8
2072	print-quality-supported (1setOf type2 enum)	[this spec]	8
2073	printer-resolution (resolution)	[this spec]	8
2074	printer-resolution-default (resolution)	[this spec]	8
2075	printer-resolution-supported (1setOf resolution)	[this spec]	8
2076	separator-sheets (collection)	[this spec]	8
2077	media (type3 keyword name(MAX))	[this spec]	8
2078	media-col (collection)	[this spec]	8
2079	separator-sheets-type (type3 keyword name(MAX))		
2080		[this spec]	8
2081	separator-sheets-default (collection)	[this spec]	8

2082	separator-sheets-supported (1setOf type2 keyword)	[this spec]	8
2083	sheet-collate (type2 keyword)	[this spec]	8
2084	sheet-collate-default (type2 keyword)	[this spec]	8
2085	sheet-collate-supported (1setOf type2 keyword)	[this spec]	8
2086	sides (type2 keyword)	[this spec]	8
2087	sides-default (type2 keyword)	[this spec]	8
2088	sides-supported (1setOf type2 keyword)	[this spec]	8
2089	x-image-position (type2 keyword)	[this spec]	8
2090	x-image-position-default (type2 keyword)	[this spec]	8
2091	x-image-position-supported (1setOf type2 keyword)	[this spec]	8
2092	x-image-shift (integer(MIN:MAX))	[this spec]	8
2093	x-image-shift-default (integer(MIN:MAX))	[this spec]	8
2094	x-image-shift-supported (rangeOfInteger(MIN:MAX))	[this spec]	8
2095	x-side1-image-shift (integer(MIN:MAX))	[this spec]	8
2096	x-side1-image-shift-default (integer(MIN:MAX))	[this spec]	8
2097	x-side1-image-shift-supported (rangeOfInteger (MIN:MAX)		
2098)	[this spec]	8
2099	x-side2-image-shift (integer(MIN:MAX))	[this spec]	8
2100	x-side2-image-shift-default (integer(MIN:MAX))	[this spec]	8
2101	x-side2-image-shift-supported (rangeOfInteger (MIN:MAX))		
2102		[this spec]	8
2103	y-image-position (type2 keyword)	[this spec]	8
2104	y-image-position-default (type2 keyword)	[this spec]	8
2105	y-image-position-supported (1setOf type2 keyword)	[this spec]	8
2106	y-image-shift (integer(MIN:MAX))	[this spec]	8
2107	y-image-shift-default (integer(MIN:MAX))	[this spec]	8
2108	y-image-shift-supported (rangeOfInteger (MIN:MAX))	[this spec]	8
2109	y-side1-image-shift (integer(MIN:MAX))	[this spec]	8
2110	y-side1-image-shift-default (integer(MIN:MAX))	[this spec]	8
2111	y-side1-image-shift-supported (rangeOfInteger (MIN:MAX))		
2112		[this spec]	8
2113	y-side2-image-shift (integer(MIN:MAX))	[this spec]	8
2114	y-side2-image-shift-default (integer(MIN:MAX))	[this spec]	8
2115	y-side2-image-shift-supported (rangeOfInteger (MIN:MAX))		
2116		[this spec]	8
2117			
2118			
2119			
2120	Printer Description attributes:		
2121	document-creation-attributes-supported (1setOf type2 keyword)		
2122		[this spec]	10.1
2123			
2124	Operation attributes:		
2125	document-message (text(MAX))	[this spec]	9.1.18
2126			

2127 17.2 Keyword attribute values

2128 ACTION (Tom) - Need to list the keyword attribute values. Do so by reference to the values registered for
2129 corresponding attributes.

2130 17.3 Enum Attribute Values

2131 The following table lists all the new enum attribute values defined in this document as additional type2 enum values.
2132 These are to be registered according to the procedures in RFC 2911 [rfc2911] section 6.1.

2133	Value	Name	Reference	Section:
2135	-----	-----	-----	-----
2136	document-state	(type1 enum)	[this spec]	9.1.23
2137	3	pending	[this spec]	9.1.23
2138	5	processing	[this spec]	9.1.23
2139	7	canceled	[this spec]	9.1.23
2140	8	aborted	[this spec]	9.1.23
2141	9	completed	[this spec]	9.1.23
2142				
2143				
2144	operations-supported	(type2 enum)	[rfc2911]	4.4.15
2145	0x0033	Cancel-Document	[this spec]	4.5
2146	0x0034	Get-Document-Attributes	[this spec]	4.3
2147	0x0035	Get-Documents	[this spec]	3.3
2148	0x0036	Delete-Document	[this spec]	5.4
2149	0x0037	Set-Document-Attributes	[this spec]	4.4
2150				

2151 17.4 Operations

2152 The following table lists all of the operations defined in this document. These are to be registered according to the
2153 procedures in RFC 2911 [rfc2911] section 6.4.

2154	Operations	Reference	Section
2156	-----	-----	-----
2157	Cancel-Document	[this spec]	4.5
2158			
2159	Delete-Document	[this spec]	5.4
2160	Get-Document-Attributes	[this spec]	4.3
2161	Get-Documents	[this spec]	3.3
2162			
2163	Set-Document-Attributes	[this spec]	4.4
2164			

2165 17.5 Attribute Group tags

2166 The following table lists all the attribute group tags defined in this specification. These are to be registered according
2167 to the procedures in RFC 2911 [rfc2911] section 6.5.

2168	Value	Name	Reference	Section
2169	-----	-----	-----	-----
2170	0x09	document-attributes-tag	[this spec]	12
2171				

2172 **17.6 Status codes**

2173 The following table lists all the status codes defined in this specification. These are to be registered according to the
 2174 procedures in RFC 2911 [rfc2911] section 6.6.

2175	Value	Status Code Name	Reference	Section
2176	-----	-----	-----	-----
2177	0x0500:0x05FF	- Server Error:		
2178	0x050B	server-error-too-many-jobs	[this spec]	13.1
2179	0x050C	server-error-too-many-documents	[this spec]	13.2

2180 **18 Internationalization Considerations**

2181 The internationalization considerations for this extension for handling the Document object are the same as for
 2182 handling the Job object in [rfc2911].

2183 **19 Security Considerations**

2184 The Document object should provide no more increased security considerations than the Job object. The Printer
 2185 MUST provide the same access control for Document objects as for Job objects.

2186 The Printer implementer needs to consider counter measures for denial of service attacks for the Create-Job
 2187 operation. For example, a rogue client could issue repeated Create-Job and/or Send-Document/Send-URI requests
 2188 in an attempt to exceed the capacity of the Printer to absorb such requests and thereby deny Job Creation and
 2189 Document Creation requests from other clients. For example, avoid a fixed set of allocations for Jobs and
 2190 Documents. Also be able to detect when an excessive number of Create-Job and Send-Document/Send-URI
 2191 requests have been supplied. In such a case, the Printer would return either a 'server-error-too-many-jobs' status
 2192 code (see section 13.1) or a 'server-error-too-many-documents' status code (see section 13.2).

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2220 **23 Appendix A: Document operations compared to Job operations**

2221 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2222 Table 16 compares the Job and Document operations. The two Conf. columns indicate the conformance
 2223 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
 2224 in the Document Conformance column means if the Document object is supported. Whether a Document operation
 2225 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
 2226 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
 2227 based protocols, APIs, and implementations.

2228 **Table 16 - 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
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

Job operations	Job Conf.	Document operations	Doc Conf
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 each document in a multi-document job.</i>	

2229
2230

2231 **24 Annex B: IEEE-ISTO 5100.4-2001 Document Overrides (informative)**

2232 With the introduction of the Document Object, there is no longer a need for the “document-overrides” (1setOf
2233 collection) attribute [pwg5100.4-2001] as an Operation attribute or a Template attribute. A new Overrides document
2234 [OvrRide] without the “document-overrides” attribute will be published. With the introduction of the Document object,
2235 the client simply supplies the Document Template attributes (see Table 10) for each Document Creation request (in a
2236 new Document Template attribute group). There is no longer a need for the “document-overrides” attribute.

2237 Page Overrides will be specified in a new document [OvrRide] that replaces the obsolete [pwg5100.4-2001]. Other
2238 [pwg5100.4-2001] features such as Subset Processing and Error/Warning counts have been moved to other
2239 specifications.

2240 **25 Annex B: Change Log (informative)**

2241 The following summaries of the changes in chronological order:

2242 Version 0.3, 9 September 2002:

- 2243 1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
- 2244 2. Added “original-requesting-user-name” Operation attribute to Table 8.
- 2245 3. Added “y” to “output-bin” in Table 10 so it MAY be a Document Template attribute.
- 2246 4. Clarified the * and in Table 11 - Job and Document Description attributes.
- 2247 5. Added section 9.1.1 all of the Printer attributes defined In any IPP standard.
- 2248 6. Allocated operation-id enums in section 11 to the 7 Document operations.
- 2249 7. Added the conformance section 14
- 2250 8. Completed the IANA Considerations section 0.

2251
2252 Version 0.4, 14 October 2002:

- 2253 1. Added the operation specifications.
- 2254 2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
- 2255 3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
- 2256 4. Added the Attribute Precedence section 6.
- 2257 5. Added [ippsave] attributes.

- 2258 6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col.
 2259 document-id-uri, and redirect-uri.
 2260

2261 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:

- 2262 1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved by
 2263 the PWG Last Call to progress as a Draft Standard.
 2264 2. Changed Cancel-Documents from OPTIONAL to REQUIRED.
 2265 3. Added Table 4 and Table 5 to show the request and response signatures of the Document Creation and
 2266 Validation operations.
 2267 4. Renamed the "document-number" Operation attribute to "input-document-number", to agree with [pwg5100.4-
 2268 2001] and because the Document object is really the Input Document (as opposed to the Output Document).
 2269 The Printer copies this value to the Document's "document-number" Document Description attribute.
 2270 5. Clarified that the Printer MUST reject a Create-Documents request if the "document-number" already exists.
 2271 6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
 2272 7. Added "document-message" (text(127)) Operation attribute to the Document Creation requests to go with the
 2273 "document-message" agreement (see point #15).
 2274 8. Fixed Create-Documents response to return Job status attributes in Group 3 and Document status attributes in
 2275 Group 4.
 2276 9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description
 2277 attribute in a Document Creation response.
 2278 10. Added the "document-mandatory-attributes" Operation attribute.
 2279 11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job
 2280 Attributes and the other Document attributes.
 2281 12. Allowed the client to supply or omit the "document-uri" Operation attribute in a Validate-Job request.
 2282 13. Clarified that the "document-number" Operation attribute MUST follow the Printer and Job Target in Group 1.
 2283 14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number"
 2284 and "document-id-uri" to be parallel with the Get-Jobs operation.
 2285 15. Changed the "message" Operation attribute in Cancel-Documents and Cancel-Current-Documents to
 2286 "document-message" Operation attribute which the Printer copies to the "document-message" Document
 2287 Description attribute for use both by the user and the operator.
 2288 16. Clarified that the "document-state-reasons" values never affect Job scheduling.
 2289 17. Made Job Level - page override programming higher precedence than Document level Document object
 2290 attributes.
 2291 18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-
 2292 requested".
 2293 19. In Table 8, flagged the Operation attributes that the Printer copies to the corresponding Job and Document
 2294 Description attributes in Document Creations operations.
 2295 20. Fixed "job-mandatory-attributes" Operation attribute so its only supplied at Job level, now that we have
 2296 "document-mandatory-attributes" Operation attribute.
 2297 21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts
 2298 with "job-mandatory-attributes" and "document-mandatory-attributes" Operation attributes.
 2299 22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages
 2300 across Input-Documents.
 2301 23. Disallowed "page-ranges" at the Page Level.
 2302 24. Disallowed "pages-per-subset" at the Document level (and Page Level).
 2303 25. Disallowed "separator-sheets" at the Page Level.
 2304 26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-
 2305 Attributes responses that the Printer MUST support, just like "job-printer-up-time" Operation attribute for Get-
 2306 Jobs and Get-Job-Attributes.
 2307

2308 Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:

- 2309 1. Deleted the Cancel-Current-Documents and Validate-Documents operations.
 2310 2. Deprecated the "input-document-number" Operation attribute from the Document Creation operations.

- 2311 3. Deleted the “document-mandatory-attributes” Operation attribute to align with the PWG Semantic model. So
 2312 both specifications have only the “job-mandatory-attributes” Operation attribute. The client can only supply
 2313 at the Job Level. The Document Level inherits from the Job Level.
 2314 4. Increased “document-message” Operation attribute length from 127 to MAX (1023) octets.
 2315 5. Clarified that “ipp-attribute-fidelity” and “job-mandatory-attributes” can only be supplied at the Job Level; the
 2316 Document level inherits their values.
 2317 6. Added “ipp-attribute-fidelity” and “job-mandatory-attributes” Job Description attributes.
 2318 7. Added the “media-size-name” as a member attribute of “media-col” and as a separate Job Template attribute
 2319 as used by UPnPv1 and UPnPv2.
 2320 8. Added the “media-type” as a Job and Document Template attribute on its own as used by UPnPv1 and
 2321 UPnPv2 (as well as leaving it as a member attribute of the “media-col” Job and Document Template
 2322 attributes).
 2323 9. Renamed “document-printer-up-time” Document Description attribute to simply “printer-up-time”.
 2324 10. Added the following Job Description attributes: “ipp-attribute-fidelity”, and “job-mandatory-attributes”.
 2325 11. Removed the following Document Description attributes: “ipp-attribute-fidelity”.
 2326 12. Added the following Document Description attributes: “document-format-detail”, “document-format-detected”,
 2327 “job-id”, “job-printer-uri”, “job-uri”, “output-device-assigned”.
 2328 13. Defined all of the Document Description attributes, often with references to other specifications, so that they
 2329 appear in the table of contents.
 2330

2331 Version 0.7, 14 March 2003, agreements from the Maui January PWG meeting and subsequent telecons:

- 2332 1. Fixed up the file naming and numbering to agree with the latest PWG process agreements.
 2333 2. Updated the Abstract and Introduction to reflect the additions.
 2334 3. Fixed cross references to use the standard numbers as agreed, rather than mnemonic references.
 2335 4. Deprecated the “input-document-number” Operation attribute ([pwg5100.4-2001] section 9.2.1 in the Create-
 2336 Document Requests
 2337 5. Renamed Send-Data to Send-Document-Data to more clearly reflect the scope of the operation.
 2338 6. Added the REQUIRED Close-Job operation to close a job that contains Document objects. Using “last-
 2339 document” still works too and the Printer MUST support both ways.
 2340 7. Retained the idea that the Printer MUST NOT copy down any attributes supplied in the Job Creation
 2341 operation to the Document object as observable in Document object query responses. Document objects
 2342 inherit that effect from the Job object.
 2343 8. Added the following operation and Document Description attributes: document-container-summary
 2344 (collection), document-creator-application-name (name(MAX)), document-creator-application-version
 2345 (text(127)), document-creator-os-name (name(40)), document-creator-os-version (text(40)), document-
 2346 format-device-id (text(127)), document-format-version (text(127)). The “document-container-summary”
 2347 collection attribute may contain them, plus “document-format” and “document-natural-language”.
 2348 9. REQUIRED Printers to support “document-format-version” Document Description.
 2349 10. Deprecated “document-overrides” and indicated that the agreement is to re-issue [pwg5100.4-2001] without
 2350 “document-overrides”.
 2351 11. Prefixed the following three Document Description attributes that are copies of Job Description attributes with
 2352 “document-“ so that no Document attribute has a “job-“ prefix: “job-printer-uri” becomes “document-job-
 2353 printer-uri”, “job-uri” becomes “document-job-uri”, and “job-id” becomes “document-job-id”.
 2354 12. Added the encoding for the “document-attributes-tag” as 0x09.
 2355 13. Updated the IANA Registration section, but still needs more work.
 2356

2357 Version 0.8, 24 March 2003, agreements from the March 20 telecon:

- 2358 1. Changed the name of the Send-Document-Data back to Send-Data to keep the name short. There wasn't
 2359 support for keeping the name of the object affected in the name of the operation.
 2360 2. Changed “job-mandatory-attributes” operation/Job Description attribute so that a Printer MUST support it.
 2361 3. Changed the name of the collection attribute back to “document-format-details”.
 2362 4. Removed the Operation attributes and Document Description attributes that were already in the member
 2363 attributes of “document-format-details”, so that any details must use the “document-format-details” (1setOf
 2364 collection).

- 2365 5. Clarified that with the removal of "document-overrides", that the client can achieve subset finishing using
 2366 "pages-per-subset" and "page-overrides".
 2367 6. Clarified that a Printer that supports "page-overrides" Document Template attribute MUST also support it as
 2368 an Operation attribute in Send-Document and Send-URI, but not Create-Document, for backward
 2369 compatibility.
 2370 7. Clarified that containers may contain containers, but that the "document-format-details" MUST be flattened, if
 2371 present.
 2372 8. Clarified that the collection values MAY describe the container format itself, in which case, it must be the first
 2373 collection value.
 2374 9. Added "document-format-details-detected (1setOf collection) Document Description attribute.
 2375 10. Clarified that "document-natural-language" identifies the primary or first language if a Document contains
 2376 more than one language.
 2377 11. Added document-format-details-supported (1setOf type2 keyword) Printer Description attribute.
 2378 12. Added document-format-details-implemented (1setOf collection) Printer Description attribute.
 2379 13. Clarified that a Printer MUST support the "document-creation-attributes-supported" (1setOf type2 keywords)
 2380 Printer Description attribute.
 2381

2382 Version 0.9, 7 April 2003, agreements from the April 3 telecon:

- 2383 1. Added "document-charset" (charset), "document-digital-signature" (type2 keyword), "document-format-
 2384 version" (text(127)), and "document-natural-language" (naturalLanguage) Operation and Document
 2385 Description attributes and corresponding "xxx-default" and "xxx-supported" Printer Description attributes.
 2386 2. Changed the "document-natural-language" member attribute of "document-format-details" (1setOf collection)
 2387 operation attribute to be 1setOf, but kept the top level "document-natural-language" Operation attribute as
 2388 single-valued.
 2389 3. Added Summary Table 2 of new Operation/Document Description attributes.
 2390 4. Defined CONDITIONALLY REQUIRED and CMUST Conformance Terms.
 2391 5. Deleted the "document-id-uri" Operation attribute no longer needed by PSI.
 2392 6. Changed "ipp-attribute-fidelity" so it doesn't affect operation attributes, so it is the same as in [rfc2911].
 2393 7. Clarified the operation attributes supplied at the Job Level in Print-Job and Print-URI versus Create-Job by
 2394 introducing the "p" notation in Table 8.
 2395 8. Added columns to Table 8 to show the corresponding Document Description attributes and the "xxx-default"
 2396 and "xxx-supported" Printer Description attributes.
 2397 9. Clarified that all of the new Operation attributes are hints, except "document-charset" and "document-format"
 2398 and that the client can turn them into Must Honor by supplying their keyword attribute names in the "job-
 2399 mandatory-attributes" Operation attribute.
 2400 10. Add the unique lang prefix from the Printer MIB to all "document-format-version" values, so that they can all
 2401 be in a single flat list for the Printer's "document-format-version-supported" Printer Description attribute.
 2402

2403 Version 0.10, May 1, 2003, agreements from the May 1 telecon:

- 2404 1. Removed the conformance language from the Abstract.
 2405 2. Clarified that the "job-mandatory-attributes" can include keywords that the Printer doesn't support. The
 2406 rejection occurs only if the client actually supplies the unsupported Template attribute in a request.
 2407 3. Clarified that a Print-Job is indistinguishable to Create-Job and one Send-Document.
 2408 4. Added that the Printer MUST reject a redundant Close-Job.
 2409 5. Clarified that the Printer MUST validate Create-Document in the context of the Job as a whole, including
 2410 previous Documents in the same Job.
 2411 6. Split Table 7 of Operation Attributes into two. Show the syntaxes for the "xxx-default" and "xxx-supported"
 2412 attributes in the first table.
 2413 7. Split the Print-Job/Print-URI from the Create-Job into two columns.
 2414 8. Added "output-device-requested" Operation attribute.
 2415 9. Added the Printer options (reject, hold, ignore) when the client supplies unsupported values in the Operation
 2416 attributes for all but "compression", "document-charset", "document-format".
 2417 10. Use the 'application/vnd.PWG-XXX' for unregistered Printer MIB printer languages.
 2418 11. Added "output-device-requested (name(127) Operation/Job Description attribute for Job Creation operations.

- 2419 12. Added "document-format-target" (mimeType) and "document-format-version-target" (text(127) Job
2420 Template and Document Template attributes.
2421 13. Clarified that a Document Template attribute share the "xxx-default" and "xxx-supported" Printer attribute
2422 values with the Job Template attribute of the same name.
2423 14. Added that Document Template attributes MAY have corresponding "xxx-actual" Document Description
2424 attributes.
2425 15. Added "document-format-version-detected" Document Description attribute.
2426 16. Added 'digital-signature-did-not-verify', and 'digital-signature-type-not-supported', and [job-]errors-detected' to
2427 "job-state-reasons" and "document-state-reasons".
2428 17. Added 'job-digital-signature-wait' to "job-state-reasons".
2429

2430 Version 0.11, May 9, 2003, agreements from the May 1 telecon:

- 2431 1. Split the document up into 3 separate documents.
2432 a. The Document Object extension to IPP
2433 b. Job and Document extensions to IPP from IPPFAX, PSI and others
2434 c. Future extensions
2435 2. Added 'server-error-too-many-jobs' and 'server-error-too-many-documents' status codes.
2436 3. Removed Create-Document and Send-Data operations.
2437 4. Removed Job State and job-state-reasons info
2438

2439 Version 0.12, June 3, 2003,

- 2440 1. Incorporated Tom's editorial changes.
2441 2. Made changes from the May 22 telecon:
2442 a. Replaced 5100.4 with OvrRide
2443 b. Removed [job-] convention everywhere
2444 c. Removed "hints"
2445 d. Added HW defaults to precedence
2446 e. Fixed all table headers
2447 f. Removed Close-Job
2448 3. Updated references throughout
2449 4. added xxx-supported and xxx-default IANA registrations
2450 5. Removed "forwarding server" discussion
2451 6. Removed "overrides" operational attribute in document operations. "overrides" are now treated as any other
2452 Template attribute
2453