The Printer Working Group

IPP Document Object v1.2 (DOCOBJECT)

Status: Approved

Abstract: This specification defines the IPP Document object and its associated attributes, values, group, and operations.

This is a PWG Candidate Standard. For a definition of a "PWG Candidate Standard", see:

https://ftp.pwg.org/pub/pwg/general/process/pwg-process-4.pdf

This specification is available electronically at:

https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject12-20240517-5100.5.docx
https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject12-20240517-5100.5.pdf

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1. Introduction

This specification extends the Internet Printing Protocol/1.1 [STD92] by defining the IPP Document object and its associated attributes, values, group, and operations. The IPP Job object is extended to contain zero or more addressable Document objects representing the Documents submitted for and operated on by the Job.

This specification updates portions of the previous version of this specification [PWG5100.5-2019]. A list of changes can be found in section 14.

2. Terminology

2.1 Conformance Terminology

Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD, SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as defined in Key words for use in RFCs to Indicate Requirement Levels [BCP14]. This specification defines the following additional capitalized conformance terms:

CONDITIONALLY REQUIRED: A MUST conformance requirement that applies only when a specified condition is true.

DEPRECATED: A SHOULD NOT conformance requirement for previously defined and approved protocol elements that are planned to be removed from use.

OBSOLETE: A MUST NOT conformance requirement for previously defined and approved protocol elements that have been removed from use.

2.2 Printing Terminology

The following printing terms are used in this document:

Attribute Precedence: The rules which dictate which attribute value takes precedence when the same attribute is supplied at different points in the workflow with different values, such as at both the Job Level and the Document Level.

Document: An object created and managed by a Printer that contains description, processing, and status information. A Document object may have attached data and is bound to a single Job.

28 *Document Creation Operation*: Operations that create Document objects including Print-Job,
29 Print-URI, Send-Document, and Send-URI as defined in the IPP/1.1 Model and Semantics
30 [STD92].

31 *Document Level*: Operation and Document Template attributes supplied in the Send-
32 Document and Send-URI operations are referred to as being supplied at the Document
33 Level. Attributes supplied in the Print-Job and Print-URI operations are considered as being
34 supplied at the Job Level only, *not* also at the Document Level, even though Print-Job and
35 Print-URI also create Document objects.

36 *Document Template*: An attribute that the Client supplies in a Send-Document or Send-URI
37 request in the Document attributes group, e.g., "media".

38 *Honor*: A Printer is said to honor an attribute supplied by the Client if the Printer supports
39 the attribute and supplied value and conforms to the defined semantics.

40 *Job*: An object created and managed by a Printer that contains description, processing, and
41 status information. The Job also contains zero or more Document objects.

42 *Job Creation Operation*: Operations that create Job objects including Create-Job, Print-Job,
43 and Print-URI as defined in the IPP/1.1 Model and Semantics [STD92].

44 *Job Level*: Operation and Job Template attributes supplied in Print-Job, Print-URI, and
45 Create-Job requests are referred to as being supplied at the Job Level.

46 *Logical Device*: a print server, software service, or gateway that processes jobs and either
47 forwards or stores the processed job or uses one or more Physical Devices to render output
48 [STD92].

49 *Output Device*: a single Logical or Physical Device [STD92].

50 *Physical Device*: a hardware implementation of an endpoint device, e.g., a marking engine,
51 a fax modem, etc. [STD92]

52 ## 2.3 Protocol Role Terminology

53 The following protocol roles are defined to specify unambiguous conformance requirements:

54 *Client*: Initiator of outgoing connections and sender of outgoing operation requests
55 (Hypertext Transfer Protocol -- HTTP/1.1 [STD99] User Agent).

56 *Printer*: Listener for incoming connections and receiver of incoming operation requests
57 (Hypertext Transfer Protocol -- HTTP/1.1 [STD99] Server) that represents one or more
58 Physical Devices or a Logical Device.

59   ## 2.4 Acronyms and Organizations

60   *IANA*: Internet Assigned Numbers Authority, https://www.iana.org/

61   *IETF*: Internet Engineering Task Force, https://www.ietf.org/

62   *ISO*: International Organization for Standardization, https://www.iso.org/

63   *PWG*: Printer Working Group, https://www.pwg.org/

64   # 3. Requirements

65   ## 3.1 Rationale

66   The Internet Printing Protocol/1.1 [STD92] defines the IPP Model and Semantics, including
67   abstract objects for a Printer that processes Jobs and the Jobs themselves which process
68   Documents. Given the need to directly address Documents in a Job, the IPP Document
69   Object v1.2 should:

70   1. Define an abstract IPP Document object and its attributes;
71   2. Define new IPP operations for the IPP Document object; and
72   3. Extend existing IPP operations as needed to support the IPP Document object.

73   Rationale for the changes from the previous versions of this specification can be found in
74   section 14.

75   ## 3.2 Use Cases

76   ### 3.2.1 Specify Per-Document Print Intent

77   Jane is printing a multi-volume report and would like the output printed together. She uses
78   an application on her computer to select each volume in the report and a shipping envelope.
79   She then initiates a print action, specifying the media and finishing processes for each
80   volume and the media for the shipping envelope. The printer processes all of the documents
81   as a single job, placing the hardcopy output in a mailbox together.

82 **3.2.2 See a List of Documents in a Job**

83 John has submitted a multi-document job to a printer but cannot remember if he included all
84 of the documents needed. He uses an application on his mobile device to query the list of
85 documents in the print job and display them on the screen.

86 **3.2.3 Cancel a Single Document**

87 Bob has submitted a multi-document job to a printer but realizes there was a typographical
88 error in one of the documents that has not yet printed. He uses an application on his
89 computer to view the list of jobs on the printer, views the list of documents in the job he
90 submitted, and initiates a cancel action for the document containing the error.

91 # 3.3 Exceptions

92 There are no exceptions defined for this specification.

93 # 3.4 Out of Scope

94 The following are considered out of scope for this specification:

95   1. Definition of copy or page level semantics; and
96   2. Definition of per-page or per-copy overrides.

97 # 3.5 Design Requirements

98 The design requirements for this specification are:

99   1. Define an abstract IPP Document object and its semantics;
100   2. Define an attribute group tag for attributes of an IPP Document object;
101   3. Define attributes and values to describe an IPP Document object;
102   4. Define operations for querying and manipulating IPP Document objects;
103   5. Extend existing operations to explicitly create IPP Document objects;
104   6. Define security requirements necessary to support IPP Document objects; and
105   7. Define sections to register all objects, attribute groups, attributes, values, and
106   operations with IANA.
107

108 # 4. Model

109 The Internet Printing Protocol/1.1 [STD92] defines an object model containing a Printer that
110 processes Jobs and a Job that processes Documents. This specification extends the Model
111 with an addressable Document object with its own attributes and state. Printers MAY support
112 multiple Documents per Job.

113 ## 4.1 Document Object

114 The Document object represents a single Document in a Job that contains Document-
115 specific Description, Status, and Template attributes. Document Description attributes
116 provide information about the Document, Document Status attributes provide state
117 information for the Document, and Document Template attributes override the
118 corresponding Job Template attributes for the Document. A Document object also contains
119 the Document data and/or a URI that references the Document data. Figure 1 shows the life
120 cycle of the Document object.
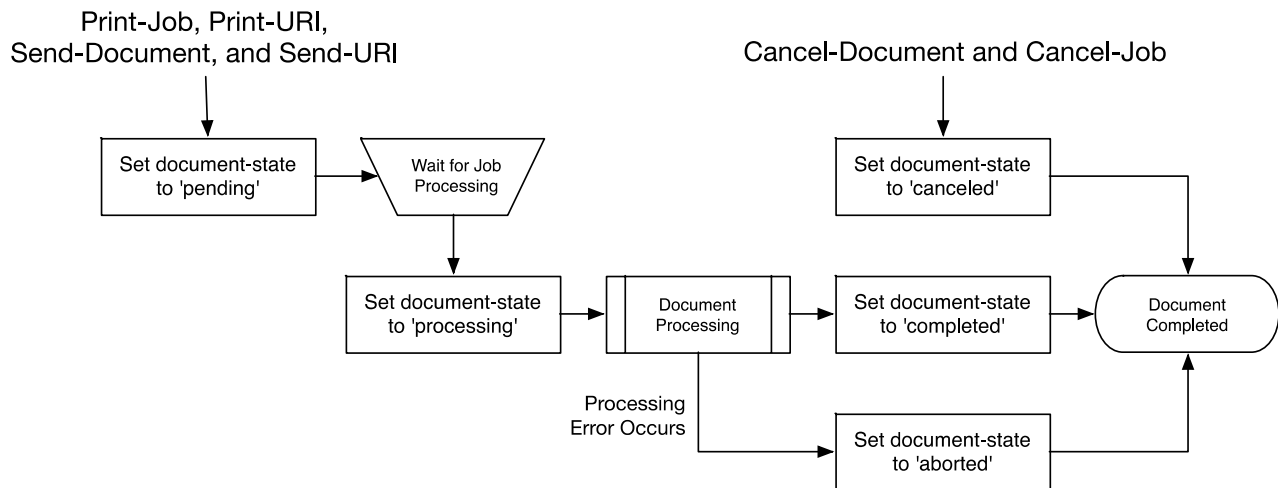
121

122 **Figure 1 - Document Object Life Cycle**

123 ## 4.2 Operations

124 The Print-Job and Print-URI operations [STD92] create a Job object containing a single
125 Document object while the Create-Job operation [STD92] creates a Job object with no
126 Document objects. The Send-Document and Send-URI operations [STD92] add Document
127 objects to the specified Job object. Printers conforming to this specification MUST support
128 the Create-Job and Send-Document operations.

129 This specification extends the Send-Document and Send-URI operations to accept
130 Document Template attributes in the Document Attributes group. The Document Template

131 attributes are applied to the Document object being created, overriding any corresponding
132 Job Template attributes supplied at the Job Level which allows the Client to vary the
133 Document Template attributes between Document objects in a single Job.

134 This specification also defines one new Job operation and four new Document operations.
135 Table 1 lists the operations and their conformance requirements.

136   **Table 1 - IPP Operations**

Operation	Target	Conformance	Reference
Cancel-Document	Document	MUST	Section 5.1.1
Create-Job	Printer	MUST	STD 92
Get-Document-Attributes	Document	MUST	Section 5.1.2
Get-Documents	Job	MUST	Section 5.2.1
Print-Job	Printer	MUST	STD 92, Section 8.3
Print-URI	Printer	MAY	STD 92, Section 8.3
Send-Document	Job	MUST	STD 92, Section 8.4
Send-URI	Job	MAY	STD 92, Section 8.5
Set-Document-Attributes	Document	MAY	Section 5.1.3

137 ## 4.3 Job and Document Template Attributes

138 Clients OPTIONALLY supply Job Template attributes in Create-Job, Print-Job, and Print-
139 URI requests, and OPTIONALLY supply Document Template attributes in Print-Job, Print-
140 URI, Send-Document, and Send-URI requests. Job Template attributes apply to the Job as
141 a whole. Document Template attributes apply only to the corresponding Document object.

142 Printers MUST support the following Attribute Precedence from highest to lowest when
143 processing a Document:

144   1. Document Level - The Document Template attributes supplied in the Document
145   Creation request or a subsequent Set-Document-Attributes request;
146   2. Job Level - The Job Template attributes supplied in the Job Creation request or
147   a subsequent Set-Job-Attributes request; and
148   3. Printer Default - The Printer Default attributes as supplied by the manufacturer
149   or configured by the operator or administrator using a Set-Printer-Attributes
150   request.

151 Note: Depending on the value of the "pdl-override-supported" Printer Description attribute
152 [STD92], device commands embedded in the Document data could override attributes
153 specified at any of the previous levels.

154 # 5. New Operations

155 This section defines the new IPP operations for this specification.

156 Note: The Internet Printing Protocol/1.1 [STD92] deprecates the "job-uri" operation attribute
157 for specifying the target Job and recommends that Clients send the "printer-uri" and "job-id"
158 operation attributes instead.

159 ## 5.1 Document Operations

160 ### 5.1.1 Cancel-Document

161 This REQUIRED Document operation allows a Client to cancel a specified Document in a
162 specified Print Job any time from the time the Document is created up to, but not including,
163 the time that the Document is completed, canceled, or aborted. Since a Document might
164 already be printing by the time a Cancel-Document request is received, some media sheet
165 pages might be printed before the Document processing is actually terminated.

166 The Cancel-Document operation does not remove the Document from the Job and Printer,
167 but only sets the specified Document's "document-state" Document Status attribute to
168 'canceled' and the Document's "document-state-reasons" Document Status attribute with
169 'canceled-by-user' or 'canceled-by-operator'. If the Job object is printed again using
170 operations such as Resubmit-Job [PWG5100.11], any canceled Documents are also printed
171 again. Thus Cancel-Document has the same semantics as Cancel-Job [STD92] which only
172 cancels the processing of the Job and doesn't delete the Job object itself.

173 The Printer MUST accept or reject the request based on the Document's current state and
174 transition the Document to the indicated new state as shown in Table 2.

175 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
176 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
177 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
178 appropriate.
179

180   **Table 2 - Document State Transitions for Cancel-Document**

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' (note 1)
'processing'	'processing'	'client-error-not-possible' (note 2)
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

181   Note 1: If the implementation requires some measurable time to cancel the
182   Document in the 'processing' state, the Printer MUST add the 'processing-to-stop-
183   point' value to the Document's "document-state-reasons" attribute and then
184   transition the Document to the 'canceled' state when the processing ceases.

185   Note 2: If the Document object already has the 'processing-to-stop-point' value in its
186   "document-state-reasons" attribute, then the Printer MUST reject the Cancel-
187   Document request.

188   **5.1.1.1 Cancel-Document Request**

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

190   Group 1: Operation Attributes

191   Natural Language and Character Set:

192   The "attributes-charset" and "attributes-natural-language" attributes as
193   described in [STD92].

194   Target:

195   Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
196   (uri) operation attribute(s) [STD92] which define the target Job object for this
197   operation, followed by the "document-number" (integer(1:MAX)) operation
198   attribute which defines the target Document object for this operation. If the
199   Client omits the "document-number" operation attribute, the Printer MUST
200   reject the request and return the 'client-error-bad-request' status code.

201   Requesting User Name:

202   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
203   the Client as described in [STD92].

204   "document-message" (text(MAX)):

205   The Client MAY supply this attribute. If supported by the Printer, the Printer
206   MUST also support the corresponding "document-message" (text(MAX))
207   Document Status attribute (see section 6.2.3) and copy the value to the
208   Document's "document-message" attribute.

5.1.1.2 Cancel-Document Response

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

211   Group 1: Operation Attributes

212   Status Message:

213   In addition to the REQUIRED status code returned in every response, the
214   response OPTIONALLY includes a "status-message" (text(255)) and/or a
215   "detailed-status-messages" (text(MAX)) Operation attribute as described in
216   [STD92].

217   Natural Language and Character Set:

218   The "attributes-charset" and "attributes-natural-language" attributes as
219   described in [STD92].

220   Group 2: Unsupported Attributes

221   See [STD92] for details on returning Unsupported Attributes.

5.1.2 Get-Document-Attributes

223   This REQUIRED Document operation allows a Client to request the values of selected
224   attributes of a Document object. The Printer MUST only return attributes that were submitted
225   by a Client or generated by the Printer.

226   The Client requests attributes using the "requested-attributes (keyword)" operation attribute
227   [STD92] which lists the attribute names and groups of interest. For Document objects the
228   possible names of attribute groups are:

229   'document-template': The subset of Document Template that the implementation
230   supports for Document objects.

231   'document-description': The subset of Document Description and Document Status
232   attributes that the implementation supports for Document objects.

233   'all': All attributes that the implementation supports for Document objects.

234 Since a Client MAY request specific attributes or named groups, there is a potential that
235 there is some overlap. For example, if a Client requests 'document-name' and 'document-
236 description', the Client is actually requesting the "document-name" attribute once by naming
237 it explicitly and once by inclusion in the 'document-description' group. In such cases, the
238 Printer returns the attribute only once in the response even if it is requested multiple times.
239 The Client SHOULD NOT request the same attribute in multiple ways.

240 Printers MUST support all group names and MUST return all supported attributes belonging
241 to the group.

242 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
243 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
244 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
245 appropriate.

246 **5.1.2.1 Get-Document-Attributes Request**

247 The following groups of attributes are part of the Get-Document-Attributes request:

248   Group 1: Operation Attributes

249   Natural Language and Character Set:

250   The "attributes-charset" and "attributes-natural-language" attributes as
251   described in [STD92].

252   Target:

253   Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
254   (uri) operation attribute(s) [STD92] which define the target Job object for this
255   operation, followed by the "document-number" (integer(1:MAX)) operation
256   which defines the target Document object for this operation. If the Client
257   omits the "document-number" operation attribute, the Printer MUST reject the
258   request and return the 'client-error-bad-request' status code.

259   Requesting User Name:

260   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
261   the Client as described in [STD92].

262   "requested-attributes" (1setOf keyword):

263   The Client OPTIONALLY supplies and the Printer MUST support this
264   attribute, which is a list of Document attribute names and/or attribute group
265   names that are returned to the Client for each Document object. If the Client
266   does not supply this attribute, the Printer MUST respond as if the Client had
267   supplied this attribute with the single value 'all'.

268   **5.1.2.2 Get-Document-Attributes Response**

269   The following groups of attributes are part of the Get-Document-Attributes response:

270   Group 1: Operation Attributes

271   Status Message:

272   In addition to the REQUIRED status code returned in every response, the
273   response OPTIONALLY includes a "status-message" (text(255)) and/or a
274   "detailed-status-messages" (text(MAX)) Operation attribute as described in
275   [STD92].

276   Natural Language and Character Set:

277   The "attributes-charset" and "attributes-natural-language" attributes as
278   described in [STD92]. The "attributes-natural-language" MAY be the natural
279   language of the Document object rather than the one in the Get-Document-
280   Attributes request.

281   Group 2: Unsupported Attributes

282   See [STD92] for details on returning Unsupported Attributes.

283   The response MAY contain the "requested-attributes" operation attribute with
284   any supplied values (attribute keywords) that were requested by the Client
285   but are not supported by the Printer. If the Printer does return unsupported
286   attributes referenced in the "requested-attributes" operation attribute and that
287   attribute included group names such as 'all', the unsupported attributes
288   MUST NOT include attributes described in the standard but not supported by
289   the implementation.

290   Group 3: Document Attributes

291   The Printer responds with the Document Description, Document Status, and
292   Document Template attributes for each returned Document object as
293   requested by the "requested-attributes" operation attribute supplied by the
294   Client in the request. The Printer ignores (does not respond with) any
295   requested attribute or value which is not supported or which is restricted by
296   the security policy in force, including whether the requesting user is the Job
297   owner. However, the Printer MUST respond with the 'unknown' out of band
298   value [STD92] for any supported attribute (including all REQUIRED
299   attributes) for which the Printer does not know the value, unless it would
300   violate the security policy.

301 **5.1.3 Set-Document-Attributes**

302 This OPTIONAL Document operation allows a Client to set the values of the attributes of a
303 Document object after the Document object is submitted to the Printer. In the request, the
304 Client supplies the set of Document attributes and values that are to be set. In the response,
305 the Printer returns success or rejects the entire request with indications of which attribute or
306 attributes could not be set.

307 This operation is similar to the Set-Job-Attributes operation [RFC3380] and follows the same
308 rules for validation. As with the Set-Job-Attributes operation, the Set-Document-Attributes
309 operation can add a new attribute, replace the value of an existing attribute, or remove an
310 attribute using 'delete-attribute' out-of-band value.

311 If the Client supplies an attribute in a Set-Document-Attributes request with the 'delete-
312 attribute' out-of-band value and that attribute is not present on the Document object, the
313 Printer ignores the attribute and does not return the attribute in the Unsupported Attributes
314 group. The Printer also returns the 'successful-ok' status code if there are no other problems
315 with the request.

316 The Printer MUST accept or reject this operation when the Document's "document-state"
317 attribute has the values shown in Table 3 but MUST NOT change the state of the Document
318 object since the Document is a passive object and the Document state is a subset of the Job
319 State. For example, in the case where the operation creates a request for unavailable
320 resources, the Job (but not the Document) transitions to a new state.

321   **Table 3 - Allowed Document States for the Set-Document-Attributes operation**

"document-state"	Printer's response status code and "action"
'pending'	'successful-ok' - if the needed resources are not ready, the Job can change state
'processing'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc.
'completed'	'client-error-not-possible'
'canceled'	'client-error-not-possible'
'aborted'	'client-error-not-possible'

322 This operation MUST NOT change the value of attributes not specified in the operation
323 unless the definition of the attribute explicitly specifies such side effects. In general,
324 Document attributes that are settable do not define side effects on other attributes that are
325 settable, only side effects on READ-ONLY attributes, if any.

326 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support
327 setting of all Document Description and Document Template attributes that the

328 implementation supports. Document Status attributes are READ-ONLY and cannot be set
329 directly using this operation.

330 Note: There is no way for the Client to set all of a Job's Document objects to the same
331 attribute values in a single operation. Either a) the Client sets the corresponding attribute in
332 each Document object in the Job with separate Set-Document-Attributes requests, or b) the
333 Client sets the corresponding attribute at the Job Level using the Set-Job-Attributes
334 operation. Setting the corresponding attribute at the Job Level (or supplying that attribute
335 initially in the Job Creation operation) causes each Document object to inherit the Job Level
336 attribute value, if the Document object doesn't have a corresponding explicit attribute
337 supplied at the Document Level. In other words, supplying an attribute at the Job Level will
338 affect all the Job's Document objects that don't have that attribute also explicitly supplied at
339 the Document Level.

340 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
341 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
342 error-forbidden',   'client-error-not-authenticated',   or   'client-error-not-authorized'   as
343 appropriate.

344 **5.1.3.1 Set-Document-Attributes Request**

345 The following groups of attributes are part of the Set-Document-Attributes request:

346   Group 1: Operation Attributes

347   Natural Language and Character Set:

348   The "attributes-charset" and "attributes-natural-language" attributes as
349   described in [STD92].

350   Target:

351   Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
352   (uri) operation attribute(s) [STD92] which define the target Job object for this
353   operation, followed by the "document-number" (integer(1:MAX)) operation
354   which defines the target Document object for this operation. If the Client
355   omits the "document-number" operation attribute, the Printer MUST reject the
356   request and return the 'client-error-bad-request' status code.

357   Requesting User Name:

358   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
359   the Client as described in [STD92].

360   Group 2: Document Attributes

361   The Client supplies one or more Document Description or Document
362   Template attributes. If supported, the Printer MUST either add the attribute (if
363   it does not already exist in the Document object), replace all values for the
364   attribute (if it already exists in the Document object), or remove the attribute
365   (if the 'delete-attribute' out-of-band value is supplied by the Client).

366 **5.1.3.2 Set-Document-Attributes Response**

367 The Printer returns the following groups of attributes as part of the Set-Document-Attributes
368 response:

369   Group 1: Operation Attributes

370   Status Message:

371   In addition to the REQUIRED status code returned in every response, the
372   response OPTIONALLY includes a "status-message" (text(255)) and/or a
373   "detailed-status-messages" (text(MAX)) Operation attribute as described in
374   [STD92].

375   Natural Language and Character Set:

376   The "attributes-charset" and "attributes-natural-language" attributes as
377   described in [STD92].

378   Group 2: Unsupported Attributes

379   See [STD92] for details on returning Unsupported Attributes.

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

386   1. The number of attributes supplied by the client exceeds the maximum
387   number that the Printer supports in a Set-Document-Attributes
388   request: return the 'client-error-request-entity-too-large' status code
389   [STD92].

390   2. The Printer doesn't support the attribute: return the attribute with the
391   'unsupported' out-of-band attribute value and the 'client-error-
392   attributes-or-values-not-supported' status code [STD92].

393   3. The attribute is READ-ONLY (in its definition) or is not-settable in this
394   implementation: return the attribute with the 'not-settable' out-of-band

395   attribute value and the 'client-error-attributes-not-settable' status code
396   [RFC3380].

397   4. The Printer doesn't support the value: if the attribute in the operation
398   has a single value, return it. If the attribute in the operation is multi-
399   valued, return only those values in a 1setOf that are not supported.
400   Return the 'client-error-attributes-or-values-not-supported' status code
401   [STD92].

402   5. The values of some of the supplied attributes conflict with one another
403   and/or other Document attribute values not being set: if the conflicting
404   attribute in the operation has a single value, return the attribute and
405   the value. If the attribute in the operation is multi-valued, return only
406   the attribute and those values in a 1setOf that are conflicting with
407   other attributes. Return the 'client-error-conflicting-attributes' status
408   code [STD92].

409   ## 5.2 Job Operations

410   ### 5.2.1 Get-Documents

411   This REQUIRED Job operation allows a Client to retrieve the list of Document objects
412   belonging to the target Job object. The Client MAY also supply a list of Document attribute
413   names and/or attribute group names. A group of Document object attributes will be returned
414   for each Document object in the Job.

415   This operation is similar to the Get-Document-Attributes operation (see section 5.1.2),
416   except that this operation returns attributes from all Document objects contained in the Job
417   object instead of from a single selected Document object in the Job object. As with the Get-
418   Document-Attributes operation, the Printer MUST only return attributes that were submitted
419   by a Client or generated by the Printer.

420   This operation is also similar to the Get-Jobs operation [STD92] except that there are no
421   equivalents to the "which-jobs" and "my-jobs" operation attributes.

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

425   Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
426   perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
427   error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
428   appropriate.

429 **5.2.1.1 Get-Documents Request**

430 The following groups of attributes are part of the Get-Documents request:

431   Group 1: Operation Attributes

432   Natural Language and Character Set:

433   The "attributes-charset" and "attributes-natural-language" attributes [STD92]

434   Target:

435   Either a) the "printer-uri" (uri) and "job-id" (integer(1:MAX)) or b) the "job-uri"
436   (uri) operation attribute(s) [STD92] which define the target Job object for this
437   operation.

438   Requesting User Name:

439   The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by
440   the Client as described in [STD92].

441   "limit" (integer(1:MAX)):

442   The client OPTIONALLY supplies and the Printer MUST support this
443   operation attribute, which determines the maximum number of Documents
444   that a Client will receive from the Printer. The limit is a "stateless limit" in that
445   if the value supplied by the Client is 'N', then only the first 'N' Documents are
446   returned in the Get-Documents Response. There is no mechanism to allow
447   for the next 'M' Documents after the first 'N' Documents. If the Client does not
448   supply the "limit" attribute, the Printer responds with all Documents in the
449   Job.

450   "requested-attributes" (1setOf keyword):

451   The client OPTIONALLY supplies and the Printer MUST support this
452   attribute, which is a list of Document attribute names and/or attribute group
453   names that are returned to the Client for each Document object. The allowed
454   attribute group names are the same as those defined in the Get-Document-
455   Attributes operation in section 5.1.2. If the Client does not supply this
456   attribute, the Printer MUST respond as if the Client had supplied this attribute
457   with the single value 'document-number'.

458 **5.2.1.2 Get-Documents Response**

459 The following groups of attributes are part of the Get-Documents request:

460   Group 1: Operation Attributes

461   Status Message:

462   In addition to the REQUIRED status code returned in every response, the
463   response OPTIONALLY includes a "status-message" (text(255)) and/or a
464   "detailed-status-messages" (text(MAX)) operation attribute as described in
465   [STD92].

466   Natural Language and Character Set:

467   The "attributes-charset" and "attributes-natural-language" attributes as
468   described in [STD92].

469   Group 2: Unsupported Attributes

470   See [STD92] for details on returning Unsupported Attributes.

471   The response MAY contain the "requested-attributes" operation attribute with
472   any supplied values (attribute keywords) that were requested by the Client
473   but are not supported by the Printer. If the Printer does return unsupported
474   attributes referenced in the "requested-attributes" operation attribute and that
475   attribute included group names such as 'all', the unsupported attributes
476   MUST NOT include attributes described in the standard but not supported by
477   the implementation.

478   Groups 3 to N: Document Attributes

479   The Printer responds with the Document Description, Document Status, and
480   Document Template attributes for each returned Document object as
481   requested by the "requested-attributes" operation attribute supplied by the
482   Client in the request. The Printer ignores (does not respond with) any
483   requested attribute or value which is not supported or which is restricted by
484   the security policy in force, including whether the requesting user is the Job
485   owner. However, the Printer MUST respond with the 'unknown' out of band
486   value [STD92] for any supported attribute (including all REQUIRED
487   attributes) for which the Printer does not know the value, unless it would
488   violate the security policy.

489   The Printer MUST return the groups in order of increasing "document-
490   number" value.

491 **6. New Attributes**

492 **6.1 Document Description Attributes**

493 **6.1.1 document-name (name(MAX))**

494 This REQUIRED Document Description attribute specifies the name of the document and is
495 copied from the "document-name" operation attribute [STD92] supplied by the Client in the
496 Document Creation request.

497 **6.2 Document Status Attributes**

498 Table 4 lists the Document Status attributes defined by this specification. Printers that
499 support a given operation or Job Status attribute MUST support the corresponding
500 Document Status attribute.

501   **Table 4 - Document Status Attributes**

Document Attribute	Operation/Job Attribute	Reference
attributes-charset (charset)	attributes-charset	[STD92]
attributes-natural-language (naturalLanguage)	attributes-natural-language	[STD92]
current-page-order (type2 keyword)	current-page-order	[PWG5100.3]
date-time-at-completed (dateTime)	date-time-at-completed	[STD92]
date-time-at-creation (dateTime)	date-time-at-creation	[STD92]
date-time-at-processing (dateTime)	date-time-at-processing	[STD92]
detailed-status-messages (1setOf text(MAX))	job-detailed-status-messages	[STD92]
document-access-errors (1setOf text(MAX))	job-document-access-errors	[STD92]
document-charset (charset)	document-charset	Sections 6.2.1 and 6.4.1
document-format (mimeMediaType)	document-format	[STD92]
document-format-detected (mimeMediaType)	<none>	Section 6.2.2
document-job-id (integer(1:MAX))	job-id	[STD92]

Document Attribute	Operation/Job Attribute	Reference
document-job-uri (uri)	job-uri	[STD92]
document-message (text(MAX))	<none>	Section 6.2.3
document-natural-language (naturalLanguage)	document-natural-language	[STD92]
document-number (integer(1:MAX))	<none>	Section 6.2.4
document-printer-uri (uri)	job-printer-uri	[STD92]
document-state (type1 enum)	job-state (note 1)	[STD92]
document-state-message (text(MAX))	job-state-message	[STD92]
document-state-reasons (1setOf type2 keyword)	job-state-reasons	[STD92]
document-uri (uri)	document-uri (note 2)	[STD92]
impressions (integer(0:MAX))	job-impressions	[STD92]
impressions-completed (integer(0:MAX))	job-impressions-completed	[STD92]
k-octets (integer(0:MAX))	job-k-octets	[STD92]
k-octets-processed (integer(0:MAX))	job-k-octets-processed	[STD92]
last-document (boolean)	<none>	Section 6.2.5
media-sheets (integer(0:MAX))	job-media-sheets	[STD92]
media-sheets-completed (integer(0:MAX))	job-media-sheets-completed	[STD92]
more-info (uri)	job-more-uri	[STD92]
output-device-assigned (name(MAX))	output-device-assigned	[STD92]
printer-up-time (integer(1:MAX))	job-printer-up-time	[STD92]
time-at-completed (integer(MIN:MAX))	time-at-completed	[STD92]
time-at-creation (integer(MIN:MAX))	time-at-creation	[STD92]
time-at-processing (integer(MIN:MAX))	time-at-processing	[STD92]

502   Note 1: The "document-state" attribute supports all of the "job-state" values *except*
503   '4' (pending-held).

504   Note 2: The "document-uri" attribute identifies the source location of the Document
505   data and is not an identifier for the Document object. The simple identifier of the
506   Document is the "document-number" Document Status attribute.

507   **6.2.1 document-charset (charset)**

508   This RECOMMENDED Document Status attribute specifies the charset used in the
509   Document data. The Printer sets this attribute from the corresponding operation attribute
510   supplied by the Client in the Document Creation request. Printers that support the
511   "document-charset" operation attribute MUST support this attribute.

512   **6.2.2 document-format-detected (mimeMediaType)**

513   This Document Status attribute is generated by the Printer to indicate the format of the
514   Document object content as detected by the Printer.

515   **6.2.3 document-message (text(MAX))**

516   This Document Status attribute contains a message from either a) the User to the Operator
517   about the Document or b) from the Operator, Administrator, or "intelligent" process to
518   indicate to the End User the reasons for modification or other management action taken on
519   the Document. The Printer populates this attribute from the "document-message" operation
520   attribute value supplied by the Client in any of the Document Creation requests or in a
521   Cancel-Document request.

522   **6.2.4 document-number (integer(1:MAX))**

523   This REQUIRED Document Status attribute is the ordinal number of the Document within
524   the Job, and determines its order of being printed in a multi-Document Job. The Printer
525   MUST generate the values monotonically increasing from 1 for each Job.

526   **6.2.5 last-document (boolean)**

527   This REQUIRED Document Status attribute indicates whether this Document is the last
528   Document in the Job [STD92]. The Printer sets this attribute from the corresponding
529   operation attribute supplied by the Client in the Document Creation request, when the Client
530   sends a Close-Job request [PWG5100.11], or when the "multiple-operation-time-out" time
531   interval has passed.

532   **6.3 Document Template Attributes**

533   This specification defines Document Template attributes for every Job Template attribute
534   that does not apply to the whole Job. Table 5 lists the new attributes.

535   **Table 5 - Document Template Attributes**

Attribute	Reference
copies (integer(1:MAX))	[STD92]
cover-back (collection)	[PWG5100.3]
cover-front (collection)	[PWG5100.3]
finishings (1setOf type2 enum)	[STD92]
finishings-col (1setOf collection)	[PWG5100.1]
force-front-side (1setOf integer(1:MAX))	[PWG5100.3]
imposition-template (type2 keyword	name(MAX))	[PWG5100.3]
media (type2 keyword	name(MAX))	[STD92]
media-col (collection)	[PWG5100.3]
media-input-tray-check (type2 keyword	name(MAX))	[PWG5100.3]
number-up (integer(1:MAX))	[STD92]
orientation-requested (type2 enum)	[STD92]
output-bin (type2 keyword	name(MAX))	[PWG5100.2]
page-delivery (type2 keyword)	[PWG5100.3]
page-order-received (type2 keyword)	[PWG5100.3]
page-ranges (1setOf rangeOfInteger(1:MAX))	[STD92]
presentation-direction-number-up (type2 keyword)	[PWG5100.3]
print-quality (type2 enum)	[STD92]
printer-resolution (resolution)	[STD92]
sides (type2 keyword)	[STD92]
x-image-position (type2 keyword)	[PWG5100.3]
x-image-shift (integer(MIN:MAX))	[PWG5100.3]
x-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
x-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-image-position (type2 keyword)	[PWG5100.3]
y-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-side1-image-shift (integer(MIN:MAX))	[PWG5100.3]
y-side2-image-shift (integer(MIN:MAX))	[PWG5100.3]

536 **6.4 Operation Attributes**

537 **6.4.1 document-charset (charset)**

538 This RECOMMENDED operation attribute specifies the character set used by the Document
539 data.

540 **6.4.2 document-number (integer(1:MAX))**

541 This REQUIRED operation attribute specifies the ordinal number of the Document within the
542 Job.

543 ## 6.5 Printer Description Attributes

544 ### 6.5.1 document-creation-attributes-supported (1setOf keyword)

545 This REQUIRED attribute lists the keyword names of the Document Template and operation
546 attributes that the Printer will accept in the Send-Document and Send-URI Document
547 Creation operations. Implementations that support the Send-URI operation MUST include
548 the 'document-uri' keyword in "document-creation-attributes-supported". Implementations
549 that do not support Send-URI MUST NOT include the 'document-uri' keyword in "document-
550 creation-attributes-supported".

551 Note: The "document-uri" attribute is specific to the Send-URI operation. Inclusion of the
552 'document-uri' keyword in "document-creation-attributes-supported" does not imply that the
553 "document-uri" attribute is valid for the Send-Document operation.

554 # 7. New Attribute Group Tags

555 ## 7.1 document-attributes-tag

556 The document-attributes-tag (0x09) attribute group tag is used to delimit Document object
557 attributes in IPP messages.
558

559 # 8. Additional Semantics for Existing Operations

560 ## 8.1 Cancel-Job: "document-state" and "document-state-reasons"

561 This REQUIRED operation sets the "document-state" Document Status attribute to
562 'canceled' and the "document-state-reasons" Document Status attribute with 'canceled-by-
563 user' or 'canceled-by-operator' for *all* Document objects in the identified Job that have not
564 yet reached a terminating state ('completed', 'canceled', or 'aborted').

565 ## 8.2 Hold-Job and Release-Job: "document-state-reasons"

566 These OPTIONAL operations affect the state of the target Job. The values of the
567 Documents' "document-state-reasons" Document Status attributes MUST NOT be affected
568 by these operations.

569 ## 8.3 Print-Job, Print-URI: Document Object and Attributes

570 This specification extends the REQUIRED Print-Job and OPTIONAL Print-URI operations
571 [STD92] to explicitly create a Document object and copy the request operation attributes
572 listed in Table 6 to the corresponding Document attributes. Printers MUST NOT copy Job
573 Template attributes to the created Document object.

574 Printers can also return the attributes listed in Table 7 in the Document attributes group after
575 the Job attributes group.

576 **Table 6 - Operation Attributes Copied to Document Objects**

Operation Attribute	Document Attribute	Reference
attributes-charset	attributes-charset	[STD92]
attributes-natural-language	attributes-natural-language	[STD92]
document-charset	document-charset	Sections 6.2.1 and 6.4.1
document-format	document-format	[STD92]
	document-format-detected	Section 6.2.2
document-message	document-message	Section 6.2.3
document-name	document-name	[STD92]
document-natural-language	document-natural-language	[STD92]
document-uri	document-uri	[STD92]
job-impressions	impressions	[STD92], Section 6.2
job-k-octets	k-octets	[STD92], Section 6.2
job-media-sheets	media-sheets	[STD92], Section 6.2

577 **Table 7 - Returned Document Status Attributes**

Document Status Attribute	Print-xxx Conformance	Send-xxx Conformance	Reference
document-number	OPTIONAL	REQUIRED	Section 6.2.4
document-state	OPTIONAL	REQUIRED	Section 6.2
document-state-message	OPTIONAL	OPTIONAL	Section 6.2
document-state-reasons	OPTIONAL	REQUIRED	Section 6.2

578   **8.3.1 Print-Job/Print-URI Response**

579   The following sets of attributes are part of the Print-Job and Print-URI responses:

580   Group 1: Operation Attributes

581   As specified in [STD92].

582   Group 2: Unsupported Attributes

583   As specified in [STD92].

584   Group 3: Job Object Attributes

585   As specified in [STD92].

586   Group 4: Document Object Attributes (new)

587   "document-number" (integer(1:MAX)):

588   The Printer MAY return the number of this Document object that was
589   assigned by the Printer starting with 1 for each Job.

590   "document-state" (type1 enum):

591   The Printer MAY return the state of this Document object.

592   "document-state-reasons" (1setOf type2 keyword):

593   The Printer MAY return the associated state reasons for this Document.

594   "document-state-message" (text(MAX)):

595   The Printer MAY return the localized description of the "document-state" and
596   "document-state-reasons" values for this Document.

597 **8.4 Send-Document: Document Object and Attributes**

598 This specification extends the REQUIRED Send-Document operation [STD92] to explicitly
599 create a Document object and copy the operation attributes listed in Table 6 to the
600 corresponding Document attributes.

601 The Send-Document request is also extended to support an additional Document Template
602 attribute group after the operation attribute group. Document Template attributes are copied
603 to the Document object after validation as described in section 4.3. Printers MUST NOT
604 copy Document Template attributes to the Job object.

605 Finally, Printers also return the attributes listed in Table 7 in the Document attributes group
606 after the Job attributes group.

607 **8.4.1 Send-Document Request**

608 The following attribute sets are part of the Send-Document request:

609   Group 1: Operation Attributes

610   As specified in [STD92].

611   Group 2: Document Template Attributes (new)

612   The Client OPTIONALLY supplies and the Printer MUST support a set of
613   Document Template attributes. If the Client is not supplying any Document
614   Template attributes in the request, the Client SHOULD omit Group 2 rather
615   than sending an empty group. However, a Printer MUST be able to accept
616   an empty group.

617   Group 3: Document Data

618   As specified in [STD92].

619 **8.4.2 Send-Document Response**

620 The following sets of attributes are part of the Send-Document response:

621   Group 1: Operation Attributes

622   As specified in [STD92].

623   Group 2: Unsupported Attributes

624   As specified in [STD92].

625   Group 3: Job Object Attributes

626   As specified in [STD92].

627   Group 4: Document Object Attributes (new)

628   "document-number" (integer(1:MAX)):

629   The Printer MUST return the number of this Document object that was
630   assigned by the Printer starting with 1 for each Job.

631   "document-state" (type1 enum):

632   The Printer MUST return the state of this Document object.

633   "document-state-reasons" (1setOf type2 keyword):

634   The Printer MUST return the associated state reasons for this Document.

635   "document-state-message" (text(MAX)):

636   The Printer MAY return the localized description of the "document-state" and
637   "document-state-reasons" values for this Document.

638 8.5 Send-URI: Document Object and Attributes

639 This specification extends the OPTIONAL Send-URI operation [STD92] to explicitly create
640 a Document object and copy the operation attributes listed in Table 6 to the corresponding
641 Document attributes.

642 The Send-URI request is also extended to support an additional Document Template
643 attribute group after the operation attribute group. Document Template attributes are copied
644 to the Document object after validation as described in section 4.3. Printers MUST NOT
645 copy Document Template attributes to the Job object.

646 Finally, Printers also return the attributes listed in Table 7 in the Document attributes group
647 after the Job attributes group.

648 8.5.1 Send-URI Request

649 The following attribute sets are part of the Send-URI request:

650   Group 1: Operation Attributes

651   As specified in [STD92].

652   Group 2: Document Template Attributes (new)

653   The Client OPTIONALLY supplies and the Printer MUST support a set of
654   Document Template attributes. If the Client is not supplying any Document
655   Template attributes in the request, the Client SHOULD omit Group 2 rather
656   than sending an empty group. However, a Printer MUST be able to accept
657   an empty group.

658   **8.5.2 Send-URI Response**

659   The following sets of attributes are part of the Send-URI response:

660   Group 1: Operation Attributes

661   As specified in [STD92].

662   Group 2: Unsupported Attributes

663   As specified in [STD92].

664   Group 3: Job Object Attributes

665   As specified in [STD92].

666   Group 4: Document Object Attributes (new)

667   "document-number" (integer(1:MAX)):

668   The Printer MUST return the number of this Document object that was
669   assigned by the Printer starting with 1 for each Job.

670   "document-state" (type1 enum):

671   The Printer MUST return the state of this Document object.

672   "document-state-reasons" (1setOf type2 keyword):

673   The Printer MUST return the associated state reasons for this Document.

674   "document-state-message" (text(MAX)):

675   The Printer MAY return the localized description of the "document-state" and
676   "document-state-reasons" values for this Document.

677 # 9. Additional Values for Existing Attributes

678 ## 9.1 notify-events (1setOf type2 keyword)

679 This specification defines the following new notification event keywords:

680 'document-completed': The Document has reached a terminating state ('aborted',
681 'canceled', or 'completed') - this is a sub-event of 'document-state-changed'

682 'document-config-changed': The Document Template or Description attributes have
683 been changed

684 'document-created': The Document has been created

685 'document-state-changed': The Document state has changed

686 'document-stopped': The Document has entered the 'processing-stopped' state -
687 this is a sub-event of 'document-state-changed'

688 ## 9.2 operations-supported (1setOf type2 enum)

689 Table 8 lists the "operation-id" values for the new operations defined in this specification.

690 **Table 8 – Operation-id Values**

Value	Operation Name	Reference
0x0033	Cancel-Document	Section 5.1.1
0x0034	Get-Document-Attributes	Section 5.1.2
0x0035	Get-Documents	Section 5.2.1
0x0037	Set-Document-Attributes	Section 5.1.3

691

692 **9.3 requested-attributes (1setOf type2 keyword)**

693 This specification defines the following additional values for the "requested-attributes"
694 operation attribute [STD92]:

695   'document-description': All Document Description and Document Status attributes.

696   'document-template': All Document Template and Printer "xxx-supported" attributes.

697 # 10. Conformance Requirements

698 ## 10.1 Printer Conformance Requirements

699 In order for a Printer to claim conformance to this specification, a Printer MUST support:

700   1. The required operations defined in section 5;
701   2. The required attributes and values defined in section 6;
702   3. The new attribute group tag defined in section 7;
703   4. The additional semantics defined in section 8;
704   5. The additional values defined in section 9;
705   6. The internationalization considerations defined in section 11; and
706   7. The security considerations defined in section 12.

707 ## 10.2 Client Conformance Requirements

708 In order for a Client to claim conformance to this specification, a Client MUST support:

709   1. The required operations defined in section 5;
710   2. The required attributes and values defined in section 6;
711   3. The new attribute group tag defined in section 7;
712   4. The additional values defined in section 9;
713   5. The internationalization considerations defined in section 11; and
714   6. The security considerations defined in section 12.
715

716 # 11. Internationalization Considerations

717 For interoperability and basic support for multiple languages, conforming implementations
718 MUST support:

719   1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)
720   [STD63] encoding of Unicode [UNICODE] [ISO10646]; and
721   2. The Unicode Format for Network Interchange [RFC5198] which requires
722   transmission of well-formed UTF-8 strings and recommends transmission of
723   normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

724 Unicode NFC is defined as the result of performing Canonical Decomposition (into base
725 characters and combining marks) followed by Canonical Composition (into canonical
726 composed characters wherever Unicode has assigned them).

727 WARNING – Performing normalization on UTF-8 strings received from Clients and
728 subsequently storing the results (e.g., in Job objects) could cause false negatives in Client
729 searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now
730 'hidden').

731 Implementations of this specification SHOULD conform to the following standards on
732 processing of human-readable Unicode text strings, see:

733   Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical

734   Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

735   Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]

736   Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

737   Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

738   Unicode Collation Algorithm [UTS10] – sorting

739   Unicode Locale Data Markup Language [UTS35] – locale databases

740 Implementations of this specification are advised to also review the following informational
741 documents on processing of human-readable Unicode text strings:

742   Unicode Character Encoding Model [UTR17] – multi-layer character model

743   Unicode Character Property Model [UTR23] – character properties

744   Unicode Conformance Model [UTR33] – Unicode conformance basis

12. Security and Privacy Considerations

The IPP extensions defined in this specification require the same security and privacy considerations as defined in the Internet Printing Protocol/1.1 [STD92].

Implementations of this specification SHOULD conform to the following standard on processing of human-readable Unicode text strings, see:

> Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

Implementations of this specification are advised to also review the following informational document on processing of human-readable Unicode text strings:

> Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

13. IANA Considerations

13.1 Attribute Registrations

The attributes defined in this specification will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following location:

https://www.iana.org/assignments/ipp-registrations

The registry entries will contain the following information:

```
Document Description attributes:                        Reference
-------------------------                               ---------
document-name (name(MAX))                               [PWG5100.5]

Document Status attributes:                             Reference
-------------------------                               ---------
attributes-charset (charset)                            [PWG5100.5]
attributes-natural-language (naturalLanguage)           [PWG5100.5]
date-time-at-completed (dateTime)                       [PWG5100.5]
date-time-at-created (dateTime)                         [PWG5100.5]
date-time-at-processing (dateTime)                      [PWG5100.5]
detailed-status-messages (1setOf text(MAX))             [PWG5100.5]
document-access-errors (1setOf text(MAX))               [PWG5100.5]
document-charset (charset)                              [PWG5100.5]
document-digital-signature(obsolete) (type2 keyword)    [PWG5100.5]
document-format (mimeMediaType)                         [PWG5100.5]
document-format-detected (mimeMediaType)                [PWG5100.5]
document-job-id (integer(1:MAX))                        [PWG5100.5]
document-job-uri (uri)                                  [PWG5100.5]
document-message (text(MAX))                            [PWG5100.5]
document-natural-language (naturalLanguage)             [PWG5100.5]
```

```
781        document-number (integer(1:MAX))                      [PWG5100.5]
782        document-printer-uri (uri)                            [PWG5100.5]
783        document-state (type1 enum)                           [PWG5100.5]
784        document-state-message (text(MAX))                    [PWG5100.5]
785        document-state-reasons (1setOf type2 keyword)         [PWG5100.5]
786        document-uri (uri)                                    [PWG5100.5]
787        impressions (integer(0:MAX))                          [PWG5100.5]
788        impressions-completed (integer(0:MAX))                [PWG5100.5]
789        k-octets (integer(0:MAX))                             [PWG5100.5]
790        k-octets-processed (integer(0:MAX))                   [PWG5100.5]
791        last-document (boolean)                               [PWG5100.5]
792        media-sheets (integer(0:MAX))                         [PWG5100.5]
793        media-sheets-completed (integer(0:MAX))               [PWG5100.5]
794        more-info (uri)                                       [PWG5100.5]
795        output-device-assigned (name(MAX))                    [PWG5100.5]
796        printer-up-time (integer(1:MAX))                      [PWG5100.5]
797        time-at-completed (integer(MIN:MAX))                  [PWG5100.5]
798        time-at-creation (integer(MIN:MAX))                   [PWG5100.5]
799        time-at-processing (integer(MIN:MAX))                 [PWG5100.5]
800
801        Document Template attributes:                         Reference
802        -----------------------------                         ---------
803        copies (integer(1:MAX))                               [PWG5100.5]
804        cover-back(deprecated) (collection)                   [PWG5100.5]
805          <Member attributes are the same as the "cover-back" Job Template
806        attribute>                                            [PWG5100.5]
807        cover-front(deprecated) (collection)                  [PWG5100.5]
808          <Member attributes are the same as the "cover-front" Job Template
809        attribute>                                            [PWG5100.5]
810        finishings (1setOf type2 enum)                        [PWG5100.5]
811        finishings-col (1setOf collection)                    [PWG5100.5]
812          <Member attributes are the same as the "finishings-col" Job Template
813        attribute>                                            [PWG5100.5]
814        force-front-side (1setOf integer(1:MAX))              [PWG5100.5]
815        imposition-template (type2 keyword | name(MAX))       [PWG5100.5]
816        media (type2 keyword | name(MAX))                     [PWG5100.5]
817        media-col (collection)                                [PWG5100.5]
818          <Member attributes are the same as the "media-col" Job Template
819        attribute>                                            [PWG5100.5]
820        media-input-tray-check(deprecated) (type2 keyword | name(MAX)) [PWG5100.5]
821        number-up (integer(1:MAX))                            [PWG5100.5]
822        orientation-requested (type2 enum)                    [PWG5100.5]
823        output-bin (type2 keyword | name(MAX))                [PWG5100.5]
824        page-delivery (type2 keyword)                         [PWG5100.5]
825        page-ranges (1setOf rangeOfInteger(1:MAX))            [PWG5100.5]
826        presentation-direction-number-up(deprecated) (type2 keyword)  [PWG5100.5]
827        print-quality (type2 enum)                            [PWG5100.5]
828        printer-resolution (resolution)                       [PWG5100.5]
829        sides (type2 keyword)                                 [PWG5100.5]
830        x-image-position (type2 keyword)                      [PWG5100.5]
831        x-image-shift (integer(MIN:MAX))                      [PWG5100.5]
832        x-side1-image-shift (integer(MIN:MAX))                [PWG5100.5]
833        x-side2-image-shift (integer(MIN:MAX))                [PWG5100.5]
834        y-image-position (type2 keyword)                      [PWG5100.5]
835        y-image-shift (integer(MIN:MAX))                      [PWG5100.5]
836        y-side1-image-shift (integer(MIN:MAX))                [PWG5100.5]
```

```
837      y-side2-image-shift (integer(MIN:MAX))              [PWG5100.5]
838
839      Operation attributes:                               Reference
840      --------------------                                ---------
841      document-charset (charset)                          [PWG5100.5]
842      document-number (integer(1:MAX))                    [PWG5100.5]
843
844      Printer Description attributes:                     Reference
845      ------------------------------                      ---------
846      document-creation-attributes-supported (1setOf keyword)  [PWG5100.5]
```

13.2 keyword Registrations

The keyword values defined in this specification will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following location:

https://www.iana.org/assignments/ipp-registrations

The registry entries will contain the following information:

```
852      Attributes (attribute syntax)
853        Keyword Attribute Value                           Reference
854        ----------------------                            ---------
855      notify-events (1setOf type2 keyword)                [RFC3995]
856        document-completed                                [PWG5100.5]
857        document-config-changed                           [PWG5100.5]
858        document-created                                  [PWG5100.5]
859        document-state-changed                            [PWG5100.5]
860        document-stopped                                  [PWG5100.5]
861
862      requested-attributes (1setOf type2 keyword)         [STD92]
863        document-description                              [PWG5100.5]
864        document-template                                 [PWG5100.5]
```

13.3 enum Registrations

The enum values defined in this specification will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following location:

https://www.iana.org/assignments/ipp-registrations

The registry entries will contain the following information:

```
870      Attributes (attribute syntax)
871        Enum Value       Enum Symbolic Name              Reference
872        ----------       ------------------              ---------
873      document-state (type1 enum)                         [PWG5100.5]
874        3                pending                          [PWG5100.5]
875        5                procesing                        [PWG5100.5]
876        6                processing-stopped               [PWG5100.5]
```

```
877          7                 canceled                      [PWG5100.5]
878          8                 aborted                       [PWG5100.5]
879          9                 completed                     [PWG5100.5]
880
881     operations-supported (1setOf type2 enum)           [STD92]
882        0x0033            Cancel-Document                [PWG5100.5]
883        0x0034            Get-Document-Attributes        {PWG5100.5]
884        0x0035            Get-Documents                  [PWG5100.5]
885        0x0037            Set-Document-Attributes         [PWG5100.5]
886
```

887   13.4 Operation Registrations

888 The operations defined in this specification will be published by IANA according to the
889 procedures in the Internet Printing Protocol/1.1 [STD92] in the following location:

890   https://www.iana.org/assignments/ipp-registrations

891 The registry entries will contain the following information:

```
892        Operation Name                                   Reference
893        --------------                                   ---------
894        Cancel-Document                                  [PWG5100.5]
895        Cancel-Job(extension)                            [PWG5100.5]
896        Get-Document-Attributes                          [PWG5100.5]
897        Get-Documents                                    [PWG5100.5]
898        Hold-Job(extension)                              [PWG5100.5]
899        Print-Job(extension)                             [PWG5100.5]
900        Print-URI(extension)                             [PWG5100.5]
901        Release-Job(extension)                           [PWG5100.5]
902        Send-Document(extension)                         [PWG5100.5]
903        Send-URI(extension)                              [PWG5100.5]
904        Set-Document-Attributes                          [PWG5100.5]
```

905   13.5 Attribute Group Registrations

906 The attribute groups defined in this specification will be published by IANA according to the
907 procedures in the Internet Printing Protocol/1.1 [STD92] in the following location:

908   https://www.iana.org/assignments/ipp-registrations

909 The registry entries will contain the following information:

```
910        Value    Attribute Group Name                      Reference
911        ------   ------------------------------------------ ---------
912        0x09     document-attributes-tag                   [PWG5100.5]
```

913 ## 14. Overview of Changes

914 ### 14.1 IPP Document Object v1.2

915
916 The following changes were made to the previous version of this specification [PWG5100.5-2019]:

917
918 • Added document notification events from the IPP Shared Infrastructure Extensions v1.0 (INFRA) [PWG5100.18-2015]

919
920
921 • DEPRECATED the "cover-back", "cover-front", "media-input-tray-check", and "presentation-number-up" Document Template attributes to match the changes made in the IPP Production Printing Extensions v2.0 (PPX) [PWG5100.3]

922 • Removed OBSOLETE attributes, values, and operations.

923 ### 14.2 IPP Document Object v1.1

924
925 The following changes were made to the previous version of this specification [PWG5100.5-2003]:

926
927 • Printers no longer need to support multiple Document Jobs, as the Document object and associated operations are useful even for single Document Jobs;

928 • Rationale and model sections have been added;

929
930 • References now point to the current versions of dependent documents and specifications at the time of publication;

931 • The "document-charset" operation attribute has been added to this specification;

932
933 • The Delete-Document operation has been made OBSOLETE because it destroys accounting information;

934
935
936 • Additional semantics for the DEPRECATED Reprocess-Job and Restart-Job operations have been removed because those operations SHOULD NOT be implemented or used;

937
938
939 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no longer promoted to persistent Job and Document attributes because they are only utilized during Job Creation;

940   • The "compression" Document Status attribute has been made OBSOLETE because
941   it serves no purpose;

942   • The "document-digital-signature" Document Status attribute has been made
943   OBSOLETE because it serves no purpose;

944   • The "document-format-details" and "document-format-details-detected" Document
945   Status attributes have been moved to the IPP Job Extensions v2.0 specification;

946   • The "document-format-version" and "document-format-version-detected" Document
947   Status attributes have been made OBSOLETE because they have serious
948   interoperability issues; and

949   • The "impressions-completed-current-copy" and "sheet-completed-copy-number"
950   Document Status attributes have been made OBSOLETE because the parent
951   specification (RFC 3381) is OBSOLETE.

952   # 15. References

953   ## 15.1 Normative References

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