



The Printer Working Group

May 17, 2024
Candidate Standard 5100.5-2024

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>
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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:

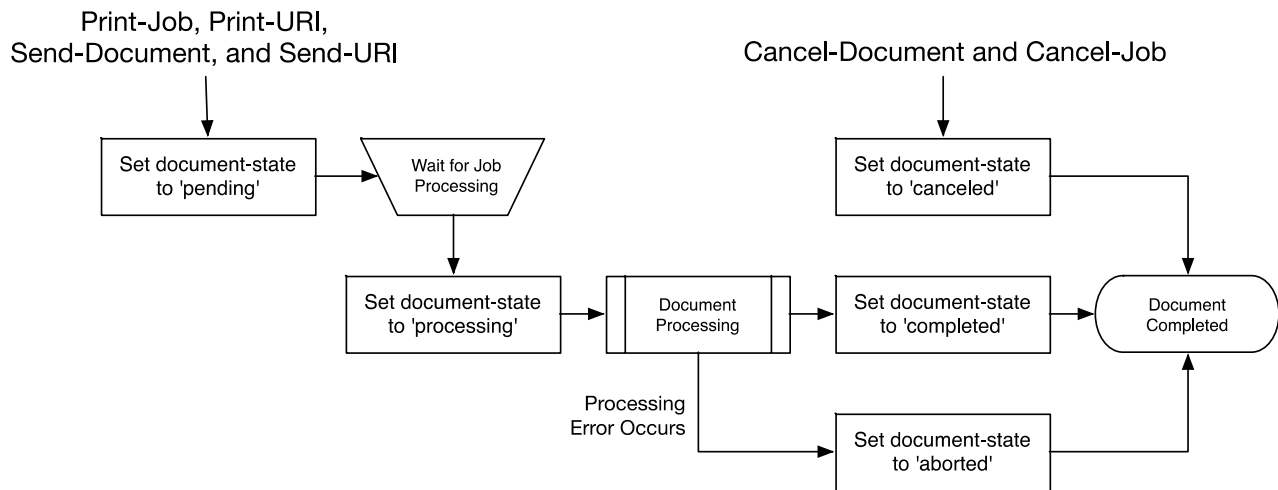
- 99 1. Define an abstract IPP Document object and its semantics;
- 100 2. Define an attribute group tag for attributes of an IPP Document object;
- 101 3. Define attributes and values to describe an IPP Document object;
- 102 4. Define operations for querying and manipulating IPP Document objects;
- 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.

209 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.

222 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-Documents-
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 (mimeType)	document-format	[STD92]
document-format-detected (mimeType)	<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" (1 setOf 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" (1 setOf 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-Documents	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

745 **12. Security and Privacy Considerations**

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

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

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

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

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

754 **13. IANA Considerations**

755 **13.1 Attribute Registrations**

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

758 <https://www.iana.org/assignments/ipp-registrations>

759 The registry entries will contain the following information:

760 Document Description attributes:	Reference
761 -----	-----
762 document-name (name(MAX))	[PWG5100.5]
763	
764 Document Status attributes:	Reference
765 -----	-----
766 attributes-charset (charset)	[PWG5100.5]
767 attributes-natural-language (naturalLanguage)	[PWG5100.5]
768 date-time-at-completed (dateTime)	[PWG5100.5]
769 date-time-at-created (dateTime)	[PWG5100.5]
770 date-time-at-processing (dateTime)	[PWG5100.5]
771 detailed-status-messages (1setOf text(MAX))	[PWG5100.5]
772 document-access-errors (1setOf text(MAX))	[PWG5100.5]
773 document-charset (charset)	[PWG5100.5]
774 document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
775 document-format (mimeMediaType)	[PWG5100.5]
776 document-format-detected (mimeMediaType)	[PWG5100.5]
777 document-job-id (integer(1:MAX))	[PWG5100.5]
778 document-job-uri (uri)	[PWG5100.5]
779 document-message (text(MAX))	[PWG5100.5]
780 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]

847 **13.2 keyword Registrations**

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

850 <https://www.iana.org/assignments/ipp-registrations>

851 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]

865 **13.3 enum Registrations**

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

868 <https://www.iana.org/assignments/ipp-registrations>

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

- 917 • Added document notification events from the IPP Shared Infrastructure Extensions
918 v1.0 (INFRA) [PWG5100.18-2015]
- 919 • DEPRECATED the "cover-back", "cover-front", "media-input-tray-check", and
920 "presentation-number-up" Document Template attributes to match the changes made
921 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 The following changes were made to the previous version of this specification [PWG5100.5-
925 2003]:

- 926 • Printers no longer need to support multiple Document Jobs, as the Document object
927 and associated operations are useful even for single Document Jobs;
- 928 • Rationale and model sections have been added;
- 929 • References now point to the current versions of dependent documents and
930 specifications at the time of publication;
- 931 • The "document-charset" operation attribute has been added to this specification;
- 932 • The Delete-Document operation has been made OBSOLETE because it destroys
933 accounting information;
- 934 • Additional semantics for the DEPRECATED Reprocess-Job and Restart-Job
935 operations have been removed because those operations SHOULD NOT be
936 implemented or used;
- 937 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no
938 longer promoted to persistent Job and Document attributes because they are only
939 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.

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1032

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1037 The author would like to especially thank the following individuals who also contributed
1038 significantly to the development of this specification:

1039 Dennis Carney (author of v1.0)

1040 Tom Hastings (author of v1.0)

1041 Ira McDonald (High North, Inc.)

1042 Peter Zehler (author of v1.0)

1043