



The Printer Working Group

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IPP Document Object v1.1 (DOCOBJECT)

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

This is a PWG Working Draft. For a definition of a "PWG Working Draft", see:

<https://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

This specification is available electronically at:

<https://ftp.pwg.org/pub/pwg/ipp/wd-ippdocobject11-20190129.docx>

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72 a stable, well understood, and technically competent specification that is widely used with
73 multiple independent and interoperable implementations. Printer manufacturers and
74 vendors of printer related software benefit from the interoperability provided by voluntary
75 conformance to these standards.

76 For additional information regarding the Printer Working Group visit:

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Table of Contents

85		
86	1. Introduction	7
87	2. Terminology	7
88	2.1 Conformance Terminology	7
89	2.2 Printing Terminology	7
90	2.3 Protocol Role Terminology	8
91	2.4 Other Terminology	8
92	2.5 Acronyms and Organizations	8
93	3. Requirements	9
94	3.1 Rationale	9
95	3.2 Use Cases	9
96	3.2.1 Specify Per-Document Print Intent	9
97	3.2.2 See a List of Documents in a Job	9
98	3.2.3 Cancel a Single Document	9
99	3.3 Exceptions	10
100	3.4 Out of Scope	10
101	3.5 Design Requirements	10
102	4. Model	11
103	4.1 Document Object	11
104	4.2 Operations	11
105	4.3 Job and Document Template Attributes	12
106	5. New Operations	13
107	5.1 Document Operations	13
108	5.1.1 Cancel-Document	13
109	5.1.2 Get-Document-Attributes	15
110	5.1.3 Set-Document-Attributes	18
111	5.2 Job Operations	21
112	5.2.1 Get-Documents	21
113	6. New Attributes	24
114	6.1 Document Description Attributes	24
115	6.1.1 document-name (name(MAX))	24
116	6.2 Document Status Attributes	24
117	6.2.1 document-charset (charset)	26
118	6.2.2 document-format-detected (mimeMediaType)	26
119	6.2.3 document-message (text(MAX))	26
120	6.2.4 document-number (integer(1:MAX))	26
121	6.2.5 last-document (boolean)	26
122	6.3 Document Template Attributes	26
123	6.4 Operation Attributes	27
124	6.4.1 document-charset (charset)	27
125	6.4.2 document-number (integer(1:MAX))	27
126	6.5 Printer Description Attributes	28
127	6.5.1 document-creation-attributes-supported (1setOf type2 keyword)	28
128	7. New Attribute Group Tags	28
129	7.1 document-attributes-tag	28
130	8. Additional Semantics for Existing Operations	29

131 8.1 Cancel-Job: "document-state" and "document-state-reasons" 29

132 8.2 Hold-Job and Release-Job: "document-state-reasons"..... 29

133 8.3 Print-Job, Print-URI: Document Object and Attributes 29

134 8.3.1 Print-Job/Print-URI Response..... 30

135 8.4 Send-Document: Document Object and Attributes..... 31

136 8.4.1 Send-Document Request..... 31

137 8.4.2 Send-Document Response 31

138 8.5 Send-URI: Document Object and Attributes 32

139 8.5.1 Send-URI Request 32

140 8.5.2 Send-URI Response 33

141 9. Additional Values for Existing Attributes 34

142 9.1 operations-supported (1setOf type2 enum)..... 34

143 9.2 requested-attributes (1setOf type2 keyword) 34

144 10. Obsolete Operations and Attributes 35

145 10.1 Obsolete Delete-Documents Operation 35

146 10.2 Obsolete Document Status Attributes 35

147 11. Conformance Requirements 35

148 11.1 Printer Conformance Requirements 35

149 11.2 Client Conformance Requirements 36

150 12. Internationalization Considerations 36

151 13. Security Considerations 37

152 14. IANA Considerations 37

153 14.1 Attribute Registrations 37

154 14.2 Attribute Value Registrations 39

155 14.3 Type2 enum Registrations..... 40

156 14.4 Operation Registrations..... 40

157 14.5 Attribute Group Registrations 41

158 15. Overview of Changes 41

159 15.1 IPP Document Object v1.1 41

160 16. References 42

161 16.1 Normative References 42

162 16.2 Informative References 43

163 17. Author's Address 44

164 18. Change History 45

165 18.1 January 29, 2019..... 45

166 18.2 October 22, 2018..... 45

167 18.3 September 19, 2018 46

List of Tables

169

170 Table 1 - IPP Operations..... 12

171 Table 2 - Document State Transitions for Cancel-Documents..... 14

172 Table 3 - Allowed Document States for the Set-Document-Attributes operation 18

173 Table 4 - Document Status Attributes 24

174 Table 5 - Document Template Attributes 26

175 Table 6 - Operation Attributes Copied to Document Objects 29

176 Table 7 - Returned Document Status Attributes 30
177 Table 8 – Operation-id Values 34
178 Table 9 - Obsolete Document Status Attributes 35

List of Figures

179
180 Figure 1 - Document Object Life Cycle 11
181

182 **1. Introduction**

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

187 This specification obsoletes portions of the previous version of this specification
188 [PWG5100.5-2003]. A list of changes can be found in section 15.

189 **2. Terminology**

190 **2.1 Conformance Terminology**

191 Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD,
192 SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as
193 defined in Key words for use in RFCs to Indicate Requirement Levels [BCP14]. The term
194 CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that
195 applies when a specified condition is true.

196 **2.2 Printing Terminology**

197 Normative definitions and semantics of printing terms are imported from the Internet Printing
198 Protocol/1.1 [STD92].

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

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

204 *Logical Device*: a print server, software service, or gateway that processes jobs and either
205 forwards or stores the processed job or uses one or more Physical Devices to render output.

206 *Output Device*: a single Logical or Physical Device

207 *Physical Device*: a hardware implementation of an endpoint device, e.g., a marking engine,
208 a fax modem, etc.

209 **2.3 Protocol Role Terminology**

210 This specification also defines the following protocol roles to specify unambiguous
211 conformance requirements:

212 *Client*: Initiator of outgoing connections and sender of outgoing operation requests
213 (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

214 *Printer*: Listener for incoming connections and receiver of incoming operation requests
215 (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one or more
216 Physical Devices or a Logical Device.

217 **2.4 Other Terminology**

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

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

224 *Document Level*: Operation and Document Template attributes supplied in the Send-
225 Document and Send-URI operations are referred to as being supplied at the Document
226 Level. Attributes supplied in the Print-Job and Print-URI operations are considered as being
227 supplied at the Job Level only, *not* also at the Document Level, even though Print-Job and
228 Print-URI also create Document objects.

229 *Document Template*: An attribute that the Client supplies in a Send-Document or Send-URI
230 request in the Document attributes group, e.g., “media”.

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

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

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

237 **2.5 Acronyms and Organizations**

238 *IANA*: Internet Assigned Numbers Authority, <http://www.iana.org/>

239 *IETF*: Internet Engineering Task Force, <http://www.ietf.org/>

240 *ISO*: International Organization for Standardization, <http://www.iso.org/>

241 *PWG*: Printer Working Group, <http://www.pwg.org/>

242 **3. Requirements**

243 **3.1 Rationale**

244 The Internet Printing Protocol/1.1 [STD92] defines the IPP Model and Semantics, including
245 abstract objects for a Printer that processes Jobs and the Jobs themselves which process
246 Documents. Given the need to directly address Documents in a Job, the IPP Document
247 Object v1.1 should:

- 248 1. Define an abstract IPP Document object and its attributes;
- 249 2. Define new IPP operations for the IPP Document object; and
- 250 3. Extend existing IPP operations as needed to support the IPP Document object.

251 **3.2 Use Cases**

252 **3.2.1 Specify Per-Document Print Intent**

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

258 **3.2.2 See a List of Documents in a Job**

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

262 **3.2.3 Cancel a Single Document**

263 Bob has submitted a multi-document job to a printer but realizes there was a typographical
264 error in one of the documents that has not yet printed. He uses an application on his

265 computer to view the list of jobs on the printer, views the list of documents in the job he
266 submitted, and initiates a cancel action for the document containing the error.

267 **3.3 Exceptions**

268 There are no exceptions defined for this specification.

269 **3.4 Out of Scope**

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

- 271 1. Definition of copy or page level semantics; and
- 272 2. Definition of per-page or per-copy overrides.

273 **3.5 Design Requirements**

274 The design requirements for this specification are:

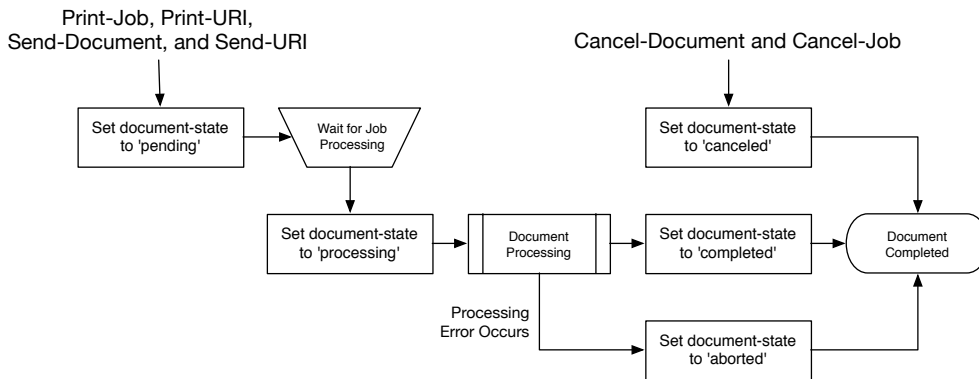
- 275 1. Define an abstract IPP Document object and its semantics;
- 276 2. Define an attribute group tag for attributes of an IPP Document object;
- 277 3. Define attributes and values to describe an IPP Document object;
- 278 4. Define operations for querying and manipulating IPP Document objects;
- 279 5. Extend existing operations to explicitly create IPP Document objects;
- 280 6. Define security requirements necessary to support IPP Document objects; and
- 281 7. Define sections to register all objects, attribute groups, attributes, values, and
- 282 operations with IANA.
- 283

284 **4. Model**

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

289 **4.1 Document Object**

290 The Document object represents a single Document in a Job that contains Document-
291 specific Description, Status, and Template attributes. Document Description attributes
292 provide information about the Document, Document Status attributes provide state
293 information for the Document, and Document Template attributes override the
294 corresponding Job Template attributes for the Document. A Document object also contains
295 the Document data and/or a URI that references the Document data. Figure 1 shows the life
296 cycle of the Document object.



297
298 **Figure 1 - Document Object Life Cycle**

299 **4.2 Operations**

300 The Print-Job and Print-URI operations [STD92] create a Job object containing a single
301 Document object while the Create-Job operation [STD92] creates a Job object with no
302 Document objects. The Send-Document and Send-URI operations [STD92] add Document
303 objects to the specified Job object. Printers conforming to this specification MUST support
304 the Create-Job and Send-Document operations.

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

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

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

312 **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

313 4.3 Job and Document Template Attributes

314 Clients OPTIONALLY supply Job Template attributes in Create-Job, Print-Job, and Print-
 315 URI requests, and OPTIONALLY supply Document Template attributes in Print-Job, Print-
 316 URI, Send-Document, and Send-URI requests. Job Template attributes apply to the Job as
 317 a whole. Document Template attributes apply only to the corresponding Document object.

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

- 320 1. Document Level - The Document Template attributes supplied in the Document
 321 Creation request or a subsequent Set-Document-Attributes request;
- 322 2. Job Level - The Job Template attributes supplied in the Job Creation request or
 323 a subsequent Set-Job-Attributes request; and
- 324 3. Printer Default - The Printer Default attributes as supplied by the manufacturer
 325 or configured by the operator or administrator using a Set-Printer-Attributes
 326 request.

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

330 **5. New Operations**

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

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

335 **5.1 Document Operations**

336 **5.1.1 Cancel-Document**

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

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

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

351 Access Rights: Only the Job Owner or an Operator or Administrator of the Printer can
352 perform this operation. Otherwise, the Printer MUST reject the operation and return 'client-
353 error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as
354 appropriate.
355

356

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'

357

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

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

362

363

364 5.1.1.1 Cancel-Document Request

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

366 Group 1: Operation Attributes

367 Natural Language and Character Set:

368 The "attributes-charset" and "attributes-natural-language" attributes as
369 described in [STD92].

370 Target:

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

377 Requesting User Name:

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

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

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

Deleted: ???

385 5.1.1.2 Cancel-Document Response

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

387 Group 1: Operation Attributes

388 Status Message:

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

393 Natural Language and Character Set:

394 The "attributes-charset" and "attributes-natural-language" attributes as
395 described in [STD92].

396 Group 2: Unsupported Attributes

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

398 5.1.2 Get-Document-Attributes

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

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

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

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

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

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

417 Printers MUST support all group names and MUST return all supported attributes belonging
418 to the group.

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

423 **5.1.2.1 Get-Document-Attributes Request**

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

425 Group 1: Operation Attributes

426 Natural Language and Character Set:

427 The "attributes-charset" and "attributes-natural-language" attributes as
428 described in [STD92].

429 Target:

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

436 Requesting User Name:

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

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

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

445 5.1.2.2 Get-Document-Attributes Response

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

447 Group 1: Operation Attributes

448 Status Message:

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

453 Natural Language and Character Set:

454 The "attributes-charset" and "attributes-natural-language" attributes as
455 described in [STD92]. The "attributes-natural-language" MAY be the natural
456 language of the Document object rather than the one in the Get-Document-
457 Attributes request.

458 Group 2: Unsupported Attributes

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

460 The response MAY contain the "requested-attributes" operation attribute with
461 any supplied values (attribute keywords) that were requested by the Client
462 but are not supported by the Printer. If the Printer does return unsupported
463 attributes referenced in the "requested-attributes" operation attribute and that
464 attribute included group names such as 'all', the unsupported attributes
465 MUST NOT include attributes described in the standard but not supported by
466 the implementation.

467 Group 3: Document Attributes

468 The Printer responds with the Document Description, Document Status, and
469 Document Template attributes for each returned Document object as
470 requested by the "requested-attributes" operation attribute supplied by the
471 Client in the request. The Printer ignores (does not respond with) any
472 requested attribute or value which is not supported or which is restricted by
473 the security policy in force, including whether the requesting user is the Job
474 owner. However, the Printer MUST respond with the 'unknown' out of band
475 value [STD92] for any supported attribute (including all REQUIRED
476 attributes) for which the Printer does not know the value, unless it would
477 violate the security policy.

478 **5.1.3 Set-Documents-Attributes**

479 This OPTIONAL Document operation allows a Client to set the values of the attributes of a
 480 Document object after the Document object is submitted to the Printer. In the request, the
 481 Client supplies the set of Document attributes and values that are to be set. In the response,
 482 the Printer returns success or rejects the entire request with indications of which attribute or
 483 attributes could not be set.

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

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

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

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

"document-state"	Printer's response status code and "action"
'pending'	'successful-ok'
'pending'	'successful-ok' - needed resources are not ready (the Job MAY 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'

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

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

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

508 Note: There is no way for the Client to set all of a Job's Document objects to the same
509 attribute values in a single operation. Either a) the Client sets the corresponding attribute in
510 each Document object in the Job with separate Set-Document-Attributes requests, or b) the
511 Client sets the corresponding attribute at the Job Level using the Set-Job-Attributes
512 operation. Setting the corresponding attribute at the Job Level (or supplying that attribute
513 initially in the Job Creation operation) causes each Document object to inherit the Job Level
514 attribute value, if the Document object doesn't have a corresponding explicit attribute
515 supplied at the Document Level. In other words, supplying an attribute at the Job Level will
516 affect all the Job's Document objects that don't have that attribute also explicitly supplied at
517 the Document Level.

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

522 **5.1.3.1 Set-Document-Attributes Request**

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

524 Group 1: Operation Attributes

525 Natural Language and Character Set:

526 The "attributes-charset" and "attributes-natural-language" attributes as
527 described in [STD92].

528 Target:

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

535 Requesting User Name:

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

538 Group 2: Document Attributes

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

544 5.1.3.2 Set-Document-Attributes Response

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

547 Group 1: Operation Attributes

548 Status Message:

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

553 Natural Language and Character Set:

554 The "attributes-charset" and "attributes-natural-language" attributes as
555 described in [STD92].

556 Group 2: Unsupported Attributes

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

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

- 564 1. The number of attributes supplied by the client exceeds the maximum
565 number that the Printer supports in a Set-Document-Attributes
566 request: return the 'client-error-request-entity-too-large' status code
567 [STD92].
- 568 2. The Printer doesn't support the attribute: return the attribute with the
569 'unsupported' out-of-band attribute value and the 'client-error-
570 attributes-or-values-not-supported' status code [STD92].
- 571 3. The attribute is READ-ONLY (in its definition) or is not-settable in this
572 implementation: return the attribute with the 'not-settable' out-of-band

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

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

580 5. The values of some of the supplied attributes conflict with one another
581 and/or other Document attribute values not being set: if the conflicting
582 attribute in the operation has a single value, return the attribute and
583 the value. If the attribute in the operation is multi-valued, return only
584 the attribute and those values in a 1setOf that are conflicting with
585 other attributes. Return the 'client-error-conflicting-attributes' status
586 code [STD92].

587 5.2 Job Operations

588 5.2.1 Get-Documents

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

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

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

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

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

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608 **5.2.1.1 Get-Documents Request**

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

610 Group 1: Operation Attributes

611 Natural Language and Character Set:

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

613 Target:

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

617 Requesting User Name:

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

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

621 The client OPTIONALLY supplies and the Printer MUST support this
622 operation attribute, which determines the maximum number of Documents
623 that a Client will receive from the Printer. The limit is a "stateless limit" in that
624 if the value supplied by the Client is 'N', then only the first 'N' Documents are
625 returned in the Get-Documents Response. There is no mechanism to allow
626 for the next 'M' Documents after the first 'N' Documents. If the Client does not
627 supply the "limit" attribute, the Printer responds with all Documents in the
628 Job.

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

630 The client OPTIONALLY supplies and the Printer MUST support this
631 attribute, which is a list of Document attribute names and/or attribute group
632 names that are returned to the Client for each Document object. The allowed
633 attribute group names are the same as those defined in the Get-Documents-
634 Attributes operation in section 5.1.2. If the Client does not supply this
635 attribute, the Printer MUST respond as if the Client had supplied this attribute
636 with the single value 'document-number'.

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637 **5.2.1.2 Get-Documents Response**

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

640 Group 1: Operation Attributes

641 Status Message:

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

646 Natural Language and Character Set:

647 The "attributes-charset" and "attributes-natural-language" attributes as
648 described in [STD92].

649 Group 2: Unsupported Attributes

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

651 The response MAY contain the "requested-attributes" operation attribute with
652 any supplied values (attribute keywords) that were requested by the Client
653 but are not supported by the Printer. If the Printer does return unsupported
654 attributes referenced in the "requested-attributes" operation attribute and that
655 attribute included group names such as 'all', the unsupported attributes
656 MUST NOT include attributes described in the standard but not supported by
657 the implementation.

658 Groups 3 to N: Document Attributes

659 The Printer responds with the Document Description, Document Status, and
660 Document Template attributes for each returned Document object as
661 requested by the "requested-attributes" operation attribute supplied by the
662 Client in the request. The Printer ignores (does not respond with) any
663 requested attribute or value which is not supported or which is restricted by
664 the security policy in force, including whether the requesting user is the Job
665 owner. However, the Printer MUST respond with the 'unknown' out of band
666 value [STD92] for any supported attribute (including all REQUIRED
667 attributes) for which the Printer does not know the value, unless it would
668 violate the security policy.

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

671 **6. New Attributes**672 **6.1 Document Description Attributes**673 **6.1.1 document-name (name(MAX))**

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

677 **6.2 Document Status Attributes**

678 Table 4 lists the Document Status attributes defined by this specification. Printers that
 679 support a given operation or Job Status attribute MUST support the corresponding
 680 Document Status attribute.

681 **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]

682 Note 1: The "document-state" attribute supports all of the "job-state" values *except*
683 '4' (pending-held).

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

687 **6.2.1 document-charset (charset)**

688 This RECOMMENDED Document Status attribute specifies the charset used in the
689 Document data. The Printer sets this attribute from the corresponding operation attribute
690 supplied by the Client in the Document Creation request. Printers that support the
691 "document-charset" operation attribute MUST support this attribute.

692 **6.2.2 document-format-detected (mimeMediaType)**

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

695 **6.2.3 document-message (text(MAX))**

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

702 **6.2.4 document-number (integer(1:MAX))**

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

706 **6.2.5 last-document (boolean)**

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

712 **6.3 Document Template Attributes**

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

715 **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]

716 6.4 Operation Attributes

717 6.4.1 document-charset (charset)

718 This RECOMMENDED operation attribute specifies the character set used by the Document
719 data.

720 6.4.2 document-number (integer(1:MAX))

721 This REQUIRED operation attribute specifies the ordinal number of the Document within the
722 Job.

723 **6.5 Printer Description Attributes**

724 **6.5.1 document-creation-attributes-supported (1setOf type2 keyword)**

725 This REQUIRED attribute lists the keyword names of the Document Template and operation
726 attributes that the Printer will accept in the Send-Document and Send-URI Document
727 Creation operations. Implementations that support the Send-URI operation MUST include
728 the 'document-uri' keyword in "document-creation-attributes-supported". Implementations
729 that do not support Send-URI MUST NOT include the 'document-uri' keyword in "document-
730 creation-attributes-supported".

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

734 **7. New Attribute Group Tags**

735 **7.1 document-attributes-tag**

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

738

739 **8. Additional Semantics for Existing Operations**

740 **8.1 Cancel-Job: "document-state" and "document-state-reasons"**

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

745 **8.2 Hold-Job and Release-Job: "document-state-reasons"**

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

749 **8.3 Print-Job, Print-URI: Document Object and Attributes**

750 This specification extends the REQUIRED Print-Job and OPTIONAL Print-URI operations
751 [STD92] to explicitly create a Document object and copy the request operation attributes
752 listed in Table 6 to the corresponding Document attributes. Printers MUST NOT copy Job
753 Template attributes to the created Document object.
754 Printers can also return the attributes listed in

755 Table 7 in the Document attributes group after the Job attributes group.

756 **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

757

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Deleted: Editor's note: The following attributes have been omitted from the table since they will have been deprecated since the publication of v1.0: "document-digital-signature", "document-format-details", and "document-format-version". Also, the "compression", "ipp-attribute-fidelity", and "job-mandatory-attributes" have been omitted since they are only evaluated at the time of Job/Document creation.

770 **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

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771 **8.3.1 Print-Job/Print-URI Response**

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

773 Group 1: Operation Attributes

774 As specified in [STD92].

775 Group 2: Unsupported Attributes

776 As specified in [STD92].

777 Group 3: Job Object Attributes

778 As specified in [STD92].

779 Group 4: Document Object Attributes (new)

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

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

783 "document-state" (type1 enum):

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

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

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

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

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

793 **8.4 Send-Document: Document Object and Attributes**

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

797 The Send-Document request is also extended to support an additional Document Template
798 attribute group after the operation attribute group. Document Template attributes are copied
799 to the Document object after validation as described in section 4.3. Printers MUST NOT
800 copy Document Template attributes to the Job object.
801 Finally, Printers also return the attributes listed in

802 Table 7 in the Document attributes group after the Job attributes group.

803 **8.4.1 Send-Document Request**

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

805 Group 1: Operation Attributes

806 As specified in [STD92].

807 Group 2: Document Template Attributes (new)

808 The Client OPTIONALLY supplies and the Printer MUST support a set of
809 Document Template attributes. If the Client is not supplying any Document
810 Template attributes in the request, the Client SHOULD omit Group 2 rather
811 than sending an empty group. However, a Printer MUST be able to accept
812 an empty group.

813 Group 3: Document Data

814 As specified in [STD92].

815 **8.4.2 Send-Document Response**

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

817 Group 1: Operation Attributes

818 As specified in [STD92].

819 Group 2: Unsupported Attributes

820 As specified in [STD92].

821 Group 3: Job Object Attributes

822 As specified in [STD92].

823 Group 4: Document Object Attributes (new)

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

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

827 "document-state" (type1 enum):

- 828 The Printer MUST return the state of this Document object.
- 829 "document-state-reasons" (1setOf type2 keyword):
- 830 The Printer MUST return the associated state reasons for this Document.
- 831 "document-state-message" (text(MAX)):
- 832 The Printer MAY return the localized description of the "document-state" and
- 833 "document-state-reasons" values for this Document.

834 **8.5 Send-URI: Document Object and Attributes**

835 This specification extends the OPTIONAL Send-URI operation [STD92] to explicitly create

836 a Document object and copy the operation attributes listed in Table 6 to the corresponding

837 Document attributes.

838 The Send-URI request is also extended to support an additional Document Template

839 attribute group after the operation attribute group. Document Template attributes are copied

840 to the Document object after validation as described in section 4.3. Printers MUST NOT

841 copy Document Template attributes to the Job object.

842 Finally, Printers also return the attributes listed in

843 Table 7 in the Document attributes group after the Job attributes group.

844 **8.5.1 Send-URI Request**

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

846 Group 1: Operation Attributes

847 As specified in [STD92].

848 Group 2: Document Template Attributes (new)

849 The Client OPTIONALLY supplies and the Printer MUST support a set of
850 Document Template attributes. If the Client is not supplying any Document
851 Template attributes in the request, the Client SHOULD omit Group 2 rather
852 than sending an empty group. However, a Printer MUST be able to accept
853 an empty group.

854 **8.5.2 Send-URI Response**

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

856 Group 1: Operation Attributes

857 As specified in [STD92].

858 Group 2: Unsupported Attributes

859 As specified in [STD92].

860 Group 3: Job Object Attributes

861 As specified in [STD92].

862 Group 4: Document Object Attributes (new)

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

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

866 "document-state" (type1 enum):

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

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

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

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

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

873 9. Additional Values for Existing Attributes

874 9.1 operations-supported (1setOf type2 enum)

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

876 **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
0x0036	Delete-Document (obsolete)	Section 10.1
0x0037	Set-Document-Attributes	Section 5.1.3

877 9.2 requested-attributes (1setOf type2 keyword)

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

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

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

882

883 **10. Obsolete Operations and Attributes**

884 **10.1 Obsolete Delete-Document Operation**

885 The obsolete Delete-Document operation removes the specified Document object and its
886 data immediately from the specified Job. This operation is obsolete because it destroys
887 accounting information about the target Document and MUST NOT be supported by new
888 implementations of this specification.

889 **10.2 Obsolete Document Status Attributes**

890 Table 9 lists the obsolete Document Status attributes that were defined in the previous
891 version of this specification [PWG5100.5-2003].

892 Note: This specification does not change the status of the original [operation or Job Status](#)
893 attributes.

Deleted: (non-Document)

894 **Table 9 - Obsolete Document Status Attributes**

Attribute	Origin
compression (type2 keyword)	[STD92]
document-digital-signature (type2 keyword)	[PWG5100.7-2003]
document-format-details (1setOf collection)	[PWG5100.7-2003]
document-format-details-detected (1setOf collection)	[PWG5100.7-2003]
document-format-version (text(127))	[PWG5100.7-2003]
document-format-version-detected (text(127))	[PWG5100.7-2003]
impressions-completed-current-copy (integer(0:MAX))	[RFC3381-OBSOLETE]
sheet-completed-copy-number (integer(0:MAX))	[RFC3381-OBSOLETE]

895 **11. Conformance Requirements**

896 **11.1 Printer Conformance Requirements**

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

- 898 1. The required operations defined in section 5;
- 899 2. The required attributes and values defined in section 6;
- 900 3. The new attribute group tag defined in section 7;
- 901 4. The additional semantics defined in section 8;
- 902 5. The additional values defined in section 9;

- 904 6. The internationalization considerations defined in section 12; and
905 7. The security considerations defined in section 13.

906 **11.2 Client Conformance Requirements**

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

- 908 1. The required operations defined in section 5;
909 2. The required attributes and values defined in section 6;
910 3. The new attribute group tag defined in section 7;
911 4. The additional values defined in section 9;
912 5. The internationalization considerations defined in section 12; and
913 6. The security considerations defined in section 13.

914 **12. Internationalization Considerations**

915 For interoperability and basic support for multiple languages, conforming implementations
916 **MUST** support:

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

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

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

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

- 931 Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
932 Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping
933 Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
934 Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences

- 935 Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 936 Unicode Collation Algorithm [UTS10] – sorting
- 937 Unicode Locale Data Markup Language [UTS35] – locale databases
- 938 Implementations of this specification are advised to also review the following informational
- 939 documents on processing of human-readable Unicode text strings:
- 940 Unicode Character Encoding Model [UTR17] – multi-layer character model
- 941 Unicode Character Property Model [UTR23] – character properties
- 942 Unicode Conformance Model [UTR33] – Unicode conformance basis

943 **13. Security Considerations**

- 944 The IPP extensions defined in this specification require the same security considerations as
- 945 defined in the Internet Printing Protocol/1.1 [STD92].
- 946 Implementations of this specification SHOULD conform to the following standard on
- 947 processing of human-readable Unicode text strings, see:
- 948 Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks
- 949 Implementations of this specification are advised to also review the following informational
- 950 document on processing of human-readable Unicode text strings:
- 951 Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

952 **14. IANA Considerations**

953 **14.1 Attribute Registrations**

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

956 <http://www.iana.org/assignments/ipp-registrations>

- 957 The registry entries will contain the following information:

958	Document Description attributes:	Reference
959	-----	-----
960	document-name (name (MAX))	[PWG5100.5]

961	Document Status attributes:	Reference
962	-----	-----
963	-----	-----
964	attributes-charset (charset)	[PWG5100.5]
965	attributes-natural-language (naturalLanguage)	[PWG5100.5]
966	compression(obsolete) (type2 keyword)	[PWG5100.5]
967	current-page-order (type2 keyword)	[PWG5100.5]
968	date-time-at-completed (dateTime)	[PWG5100.5]
969	date-time-at-created (dateTime)	[PWG5100.5]
970	date-time-at-processing (dateTime)	[PWG5100.5]
971	detailed-status-messages (1setOf text (MAX))	[PWG5100.5]
972	document-access-errors (1setOf text (MAX))	[PWG5100.5]
973	document-charset (charset)	[PWG5100.5]
974	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
975	document-format (mimeMediaType)	[PWG5100.5]
976	document-format-details(obsolete) (1setOf collection)	[PWG5100.5]
977	document-format-details-detected(obsolete) (1setOf collection)	[PWG5100.5]
978		[PWG5100.5]
979	document-format-detected (mimeMediaType)	[PWG5100.5]
980	document-format-version(obsolete) (text(127))	[PWG5100.5]
981	document-format-version-detected(obsolete) (text(127))	[PWG5100.5]
982	document-job-id (integer(1:MAX))	[PWG5100.5]
983	document-job-uri (uri)	[PWG5100.5]
984	document-message (text (MAX))	[PWG5100.5]
985	document-natural-language (naturalLanguage)	[PWG5100.5]
986	document-number (integer(1:MAX))	[PWG5100.5]
987	document-printer-uri (uri)	[PWG5100.5]
988	document-state (type1 enum)	[PWG5100.5]
989	document-state-message (text (MAX))	[PWG5100.5]
990	document-state-reasons (1setOf type2 keyword)	[PWG5100.5]
991	document-uri (uri)	[PWG5100.5]
992	impressions (integer(0:MAX))	[PWG5100.5]
993	impressions-completed (integer(0:MAX))	[PWG5100.5]
994	impressions-completed-current-copy(obsolete) (integer(0:MAX))	[PWG5100.5]
995		[PWG5100.5]
996	k-octets (integer(0:MAX))	[PWG5100.5]
997	k-octets-processed (integer(0:MAX))	[PWG5100.5]
998	last-document (boolean)	[PWG5100.5]
999	media-sheets (integer(0:MAX))	[PWG5100.5]
1000	media-sheets-completed (integer(0:MAX))	[PWG5100.5]
1001	more-info (uri)	[PWG5100.5]
1002	output-device-assigned (name (MAX))	[PWG5100.5]
1003	printer-up-time (integer(1:MAX))	[PWG5100.5]
1004	sheet-completed-copy-number(obsolete) (integer(0:MAX))	[PWG5100.5]
1005	time-at-completed (integer(MIN:MAX))	[PWG5100.5]
1006	time-at-creation (integer(MIN:MAX))	[PWG5100.5]
1007	time-at-processing (integer(MIN:MAX))	[PWG5100.5]
1008		
1009	Document Template attributes:	Reference
1010	-----	-----
1011	copies (integer(1:MAX))	[PWG5100.5]
1012	cover-back (collection)	[PWG5100.5]
1013	<Member attributes are the same as the "cover-back" Job Template	
1014	attribute>	[PWG5100.5]
1015	cover-front (collection)	[PWG5100.5]


```

1016     <Member attributes are the same as the "cover-front" Job Template
1017     attribute> [PWG5100.5]
1018     finishings (1setOf type2 enum) [PWG5100.5]
1019     finishings-col (1setOf collection) [PWG5100.5]
1020     <Member attributes are the same as the "finishings-col" Job Template
1021     attribute> [PWG5100.5]
1022     force-front-side (1setOf integer(1:MAX)) [PWG5100.5]
1023     imposition-template (type2 keyword | name(MAX)) [PWG5100.5]
1024     media (type2 keyword | name(MAX)) [PWG5100.5]
1025     media-col (collection) [PWG5100.5]
1026     <Member attributes are the same as the "media-col" Job Template
1027     attribute> [PWG5100.5]
1028     media-input-tray-check (type2 keyword | name(MAX)) [PWG5100.5]
1029     number-up (integer(1:MAX)) [PWG5100.5]
1030     orientation-requested (type2 enum) [PWG5100.5]
1031     output-bin (type2 keyword | name(MAX)) [PWG5100.5]
1032     page-delivery (type2 keyword) [PWG5100.5]
1033     page-order-received (type2 keyword) [PWG5100.5]
1034     page-ranges (1setOf rangeOfInteger(1:MAX)) [PWG5100.5]
1035     presentation-direction-number-up (type2 keyword) [PWG5100.5]
1036     print-quality (type2 enum) [PWG5100.5]
1037     printer-resolution (resolution) [PWG5100.5]
1038     sides (type2 keyword) [PWG5100.5]
1039     x-image-position (type2 keyword) [PWG5100.5]
1040     x-image-shift (integer(MIN:MAX)) [PWG5100.5]
1041     x-sidel-image-shift (integer(MIN:MAX)) [PWG5100.5]
1042     x-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1043     y-image-position (type2 keyword) [PWG5100.5]
1044     y-image-shift (integer(MIN:MAX)) [PWG5100.5]
1045     y-sidel-image-shift (integer(MIN:MAX)) [PWG5100.5]
1046     y-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1047
1048     Operation attributes: Reference
1049     -----
1050     document-charset (charset) [PWG5100.5]
1051     document-number (integer(1:MAX)) [PWG5100.5]
1052
1053     Printer Description attributes: Reference
1054     -----
1055     document-creation-attributes-supported (1setOf type2 keyword)
1056     [PWG5100.5]

```

1057 14.2 Attribute Value Registrations

1058 The attribute values defined in this specification will be published by IANA according to the
 1059 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1060 <http://www.iana.org/assignments/ipp-registrations>

1061 The registry entries will contain the following information:

```

1062     Attributes (attribute syntax)
1063     Keyword Attribute Value Reference

```

1064	-----	-----
1065	requested-attributes (1setOf type2 keyword)	[STD92]
1066	document-description	[PWG5100.5]
1067	document-template	[PWG5100.5]

1068 14.3 Type2 enum Registrations

1069 The enum values defined in this specification will be published by IANA according to the
1070 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1071 <http://www.iana.org/assignments/ipp-registrations>

1072 The registry entries will contain the following information:

1073	Attributes (attribute syntax)		
1074	Enum Value	Enum Symbolic Name	Reference
1075	-----	-----	-----
1076	operations-supported (1setOf type2 enum)		[STD92]
1077	0x0033	Cancel-Document	[PWG5100.5]
1078	0x0034	Get-Document-Attributes	{PWG5100.5}
1079	0x0035	Get-Documents	[PWG5100.5]
1080	0x0036	Delete-Document (obsolete)	[PWG5100.5]
1081	0x0037	Set-Document-Attributes	[PWG5100.5]
1082			

1083 14.4 Operation Registrations

1084 The operations defined in this specification will be published by IANA according to the
1085 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1086 <http://www.iana.org/assignments/ipp-registrations>

1087 The registry entries will contain the following information:

1088	Operation Name	Reference
1089	-----	-----
1090	Cancel-Document	[PWG5100.5]
1091	Cancel-Job (extension)	[PWG5100.5]
1092	Delete-Document (obsolete)	[PWG5100.5]
1093	Get-Document-Attributes	[PWG5100.5]
1094	Get-Documents	[PWG5100.5]
1095	Hold-Job (extension)	[PWG5100.5]
1096	Print-Job (extension)	[PWG5100.5]
1097	Print-URI (extension)	[PWG5100.5]
1098	Release-Job (extension)	[PWG5100.5]
1099	Send-Document (extension)	[PWG5100.5]
1100	Send-URI (extension)	[PWG5100.5]
1101	Set-Document-Attributes	[PWG5100.5]

1102 **14.5 Attribute Group Registrations**

1103 The attribute groups defined in this specification will be published by IANA according to the
1104 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1105 <http://www.iana.org/assignments/ipp-registrations>

1106 The registry entries will contain the following information:

1107	Value	Attribute Group Name	Reference
1108	-----	-----	-----
1109	0x09	document-attributes-tag	[PWG5100.5]

1110 **15. Overview of Changes**

1111 **15.1 IPP Document Object v1.1**

1112 The following changes were made to the previous version of this specification [PWG5100.5-
1113 2003]:

- 1114 • Printers no longer need to support multiple Document Jobs;
- 1115 • Rationale and model sections have been added;
- 1116 • References now point to the current versions of dependent documents and
1117 specifications at the time of publication;
- 1118 • The "document-charset" operation attribute has been added to this specification;
- 1119 • The Delete-Document operation has been made obsolete;
- 1120 • Additional semantics for the deprecated Reprocess-Job and Restart-Job operations
1121 have been removed;
- 1122 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no
1123 longer (incorrectly) promoted to persistent Job and Document attributes;
- 1124 • The "compression" Document Status attribute has been made obsolete because it
1125 serves no purpose;
- 1126 • Several "document-format-xxx" Document Status attributes have been made
1127 obsolete because they have serious interoperability issues; and

- 1128 • The "impressions-completed-current-copy" and "sheet-completed-copy-number"
1129 Document Status attributes have been made obsolete because the parent
1130 specification (RFC 3381) is obsolete.

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1217 ipp@pwg.org (subscribers only)

1218 To subscribe, see the PWG web page:

1219 <http://www.pwg.org/>

1220 Implementers of this specification are encouraged to join the IPP Mailing List in order to
1221 participate in any discussions of clarification issues and review of registration proposals for
1222 additional attributes and values.

1223 The editors would like to especially thank the following individuals who also contributed
1224 significantly to the development of this specification:

1225 Dennis Carney (author of v1.0)
1226 Tom Hastings (author of v1.0)
1227 Ira McDonald (High North, Inc.)
1228 Peter Zehler (author of v1.0)

1229 **18. Change History**

1230 **[18.1 January 29, 2019](#)**

- 1231 • [Status: Prototype](#)
- 1232 • [Fixed broken references throughout](#)
- 1233 • [Section 10.2: Say "operation and Job Status" instead of "non-document"](#)

1234 **18.2 October 22, 2018**

- 1235 • Status: Interim.
- 1236 • Section 4: Changed to use "This specification" instead of "This document".
- 1237 • Figure 1: Updated with the list of operations.
- 1238 • Table 1: Added target object.
- 1239 • Editorial changes throughout.
- 1240 • Updated wording of the access rights section, per WG review comments on October
1241 11, 2018
- 1242 • Table 9: Changed "Reference" column title to "Origin"
- 1243 • Updated references to the old PWG 5100.5 and 5100.7 to include the year, note they
1244 are obsolete.
- 1245 • Updated RFC 3381 to note it is obsolete, obsoleted by RFC 8011

1246 **18.3 September 19, 2018**

- 1247 • Initial revision for v1.1.
- 1248 • Updated to use new working draft template, section organizations.
- 1249 • Updated references.
- 1250 • Added Changes section.
- 1251 • Added proper rationale and model sections.
- 1252 • Printers no longer need to support multiple Document Jobs.
- 1253 • Added the "document-charset" operation attribute from PWG 5100.7.
- 1254 • Made the Delete-Document operation obsolete.
- 1255 • Made the "compression" Document Status attribute obsolete because it serves no
1256 purpose.
- 1257 • Made several "document-format-xxx" Document Status attributes from PWG 5100.7
1258 obsolete because they have serious interoperability issues.
- 1259 • Made the "impressions-completed-current-copy" and "sheet-completed-copy-
1260 number" Document Status attributes obsolete because the parent specification (RFC
1261 3381) is obsolete.