



The Printer Working Group

March 18, 2019
Working Draft

1
2
3
4
5
6
7
8
9
10
11
12
13

IPP Document Object v1.1 (DOCOBJECT)

Status: Stable

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-ippdocobject11-20190318.docx>

<https://ftp.pwg.org/pub/pwg/ipp/wd-ippdocobject11-20190318.pdf>

14 Copyright © 2004-2019 The Printer Working Group. All rights reserved.

15 This document may be copied and furnished to others, and derivative works that comment
16 on, or otherwise explain it or assist in its implementation may be prepared, copied, published
17 and distributed, in whole or in part, without restriction of any kind, provided that the above
18 copyright notice, this paragraph and the title of the document as referenced below are
19 included on all such copies and derivative works. However, this document itself may not be
20 modified in any way, such as by removing the copyright notice or references to the IEEE-
21 ISTO and the Printer Working Group, a program of the IEEE-ISTO.

22 Title: *IPP Document Object v1.1 (DOCOBJECT)*

23 The IEEE-ISTO and the Printer Working Group DISCLAIM ANY AND ALL WARRANTIES,
24 WHETHER EXPRESS OR IMPLIED INCLUDING (WITHOUT LIMITATION) ANY IMPLIED
25 WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

26 The Printer Working Group, a program of the IEEE-ISTO, reserves the right to make
27 changes to the document without further notice. The document may be updated, replaced
28 or made obsolete by other documents at any time.

29 The IEEE-ISTO takes no position regarding the validity or scope of any intellectual property
30 or other rights that might be claimed to pertain to the implementation or use of the technology
31 described in this document or the extent to which any license under such rights might or
32 might not be available; neither does it represent that it has made any effort to identify any
33 such rights.

34 The IEEE-ISTO invites any interested party to bring to its attention any copyrights, patents,
35 or patent applications, or other proprietary rights which may cover technology that may be
36 required to implement the contents of this document. The IEEE-ISTO and its programs shall
37 not be responsible for identifying patents for which a license may be required by a document
38 and/or IEEE-ISTO Industry Group Standard or for conducting inquiries into the legal validity
39 or scope of those patents that are brought to its attention. Inquiries may be submitted to the
40 IEEE-ISTO by e-mail at: ieee-isto@ieee.org.

41 The Printer Working Group acknowledges that the IEEE-ISTO (acting itself or through its
42 designees) is, and shall at all times be the sole entity that may authorize the use of
43 certification marks, trademarks, or other special designations to indicate compliance with
44 these materials.

45 Use of this document is wholly voluntary. The existence of this document does not imply that
46 there are no other ways to produce, test, measure, purchase, market, or provide other goods
47 and services related to its scope.
48

49 **About the IEEE-ISTO**

50 The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and
51 flexible operational forum and support services. The IEEE-ISTO provides a forum not only
52 to develop standards, but also to facilitate activities that support the implementation and
53 acceptance of standards in the marketplace. The organization is affiliated with the IEEE
54 (<http://www.ieee.org/>) and the IEEE Standards Association (<http://standards.ieee.org/>).

55 For additional information regarding the IEEE-ISTO and its industry programs visit:

56 <https://www.ieee-isto.org/>

57 **About the IEEE-ISTO PWG**

58 The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and
59 Technology Organization (ISTO) with member organizations including printer
60 manufacturers, print server developers, operating system providers, network operating
61 system providers, network connectivity vendors, and print management application
62 developers. The PWG is chartered to make printers and the applications and operating
63 systems supporting them work together better. All references to the PWG in this document
64 implicitly mean “The Printer Working Group, a Program of the IEEE ISTO.”

65 To meet this objective, the PWG documents the results of their work as open standards that
66 define print related protocols, interfaces, procedures, and conventions. A PWG standard is
67 a stable, well understood, and technically competent specification that is widely used with
68 multiple independent and interoperable implementations. Printer manufacturers and
69 vendors of printer related software benefit from the interoperability provided by voluntary
70 conformance to these standards.

71 For additional information regarding the Printer Working Group visit:

72 <https://www.pwg.org>

73 Contact information:

74 The Printer Working Group
75 c/o The IEEE Industry Standards and Technology Organization
76 445 Hoes Lane
77 Piscataway, NJ 08854
78 USA
79

Table of Contents

80		
81	1. Introduction	7
82	2. Terminology	7
83	2.1 Conformance Terminology	7
84	2.2 Printing Terminology	7
85	2.3 Protocol Role Terminology	8
86	2.4 Other Terminology	8
87	2.5 Acronyms and Organizations	9
88	3. Requirements	9
89	3.1 Rationale	9
90	3.2 Use Cases	9
91	3.2.1 Specify Per-Document Print Intent.....	9
92	3.2.2 See a List of Documents in a Job	10
93	3.2.3 Cancel a Single Document	10
94	3.3 Exceptions	10
95	3.4 Out of Scope.....	10
96	3.5 Design Requirements	10
97	4. Model	11
98	4.1 Document Object.....	11
99	4.2 Operations	11
100	4.3 Job and Document Template Attributes	12
101	5. New Operations	13
102	5.1 Document Operations.....	13
103	5.1.1 Cancel-Document	13
104	5.1.2 Get-Document-Attributes	15
105	5.1.3 Set-Document-Attributes.....	18
106	5.2 Job Operations	21
107	5.2.1 Get-Documents	21
108	6. New Attributes.....	24
109	6.1 Document Description Attributes	24
110	6.1.1 document-name (name(MAX))	24
111	6.2 Document Status Attributes	24
112	6.2.1 document-charset (charset)	26
113	6.2.2 document-format-detected (mimeMediaType).....	26
114	6.2.3 document-message (text(MAX)).....	26
115	6.2.4 document-number (integer(1:MAX))	26
116	6.2.5 last-document (boolean)	26
117	6.3 Document Template Attributes	26
118	6.4 Operation Attributes.....	27
119	6.4.1 document-charset (charset)	27
120	6.4.2 document-number (integer(1:MAX))	27
121	6.5 Printer Description Attributes.....	28
122	6.5.1 document-creation-attributes-supported (1setOf type2 keyword).....	28
123	7. New Attribute Group Tags.....	28
124	7.1 document-attributes-tag.....	28
125	8. Additional Semantics for Existing Operations	29

126	8.1 Cancel-Job: "document-state" and "document-state-reasons".....	29
127	8.2 Hold-Job and Release-Job: "document-state-reasons".....	29
128	8.3 Print-Job, Print-URI: Document Object and Attributes	29
129	8.3.1 Print-Job/Print-URI Response.....	31
130	8.4 Send-Document: Document Object and Attributes.....	32
131	8.4.1 Send-Document Request.....	33
132	8.4.2 Send-Document Response.....	33
133	8.5 Send-URI: Document Object and Attributes	34
134	8.5.1 Send-URI Request.....	35
135	8.5.2 Send-URI Response	35
136	9. Additional Values for Existing Attributes	36
137	9.1 operations-supported (1setOf type2 enum).....	36
138	9.2 requested-attributes (1setOf type2 keyword)	36
139	10. Obsolete Operations and Attributes	37
140	10.1 Obsolete Delete-Document Operation	37
141	10.2 Obsolete Document Status Attributes	37
142	11. Conformance Requirements	37
143	11.1 Printer Conformance Requirements	37
144	11.2 Client Conformance Requirements	38
145	12. Internationalization Considerations	38
146	13. Security Considerations	39
147	14. IANA Considerations.....	39
148	14.1 Attribute Registrations	39
149	14.2 Attribute Value Registrations	41
150	14.3 Type2 enum Registrations.....	42
151	14.4 Operation Registrations.....	42
152	14.5 Attribute Group Registrations	43
153	15. Overview of Changes.....	43
154	15.1 IPP Document Object v1.1	43
155	16. References.....	44
156	16.1 Normative References.....	44
157	16.2 Informative References	46
158	17. Author's Address	46
159	18. Change History	47
160	18.1 March 18, 2019.....	47
161	18.2 January 29, 2019.....	47
162	18.3 October 22, 2018.....	48
163	18.4 September 19, 2018	48

164

165

List of Tables

166	Table 1 - IPP Operations.....	12
167	Table 2 - Document State Transitions for Cancel-Document.....	14
168	Table 3 - Allowed Document States for the Set-Document-Attributes operation	18
169	Table 4 - Document Status Attributes	24
170	Table 5 - Document Template Attributes	26

171 Table 6 - Operation Attributes Copied to Document Objects 30
172 Table 7 - Returned Document Status Attributes 31
173 Table 8 – Operation-id Values 36
174 Table 9 - Obsolete Document Status Attributes 37

List of Figures

175
176 Figure 1 - Document Object Life Cycle 11
177

178 **1. Introduction**

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

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

185 **2. Terminology**

186 **2.1 Conformance Terminology**

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

192 The term DEPRECATED is used for previously defined and approved protocol elements that
193 SHOULD NOT be used or implemented. The term OBSOLETE is used for previously defined
194 and approved protocol elements that MUST NOT be used or implemented.

195 **2.2 Printing Terminology**

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

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

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

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

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

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

208 **2.3 Protocol Role Terminology**

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

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

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

216 **2.4 Other Terminology**

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

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

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

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

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

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

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

236 **2.5 Acronyms and Organizations**

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

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

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

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

241 **3. Requirements**

242 **3.1 Rationale**

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

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

250 Rationale for the changes from the previous versions of this specification can be found in
251 section 15.

252 **3.2 Use Cases**

253 **3.2.1 Specify Per-Document Print Intent**

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

259 **3.2.2 See a List of Documents in a Job**

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

263 **3.2.3 Cancel a Single Document**

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

268 **3.3 Exceptions**

269 There are no exceptions defined for this specification.

270 **3.4 Out of Scope**

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

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

274 **3.5 Design Requirements**

275 The design requirements for this specification are:

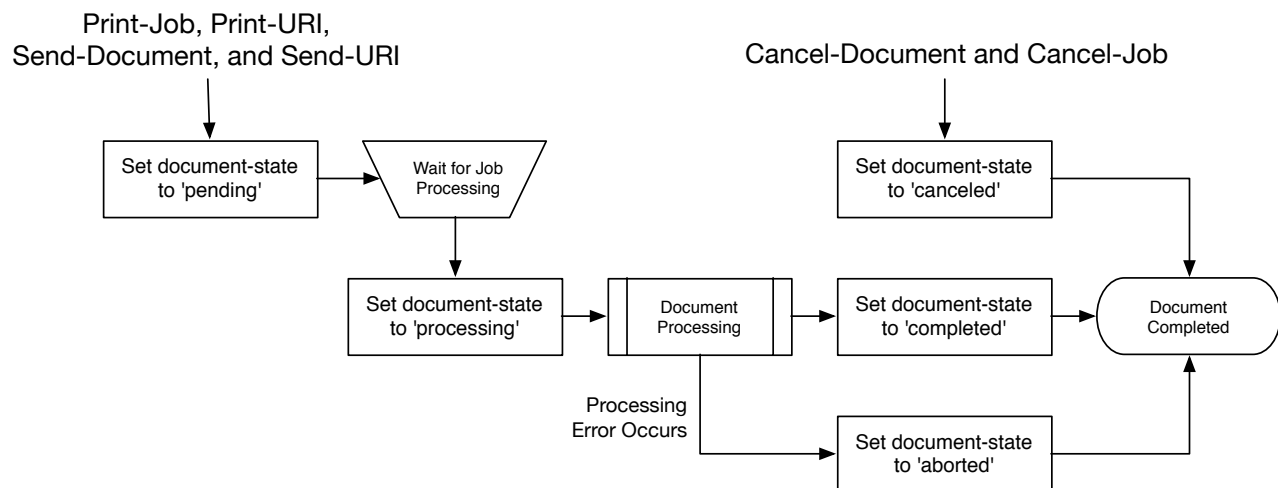
- 276 1. Define an abstract IPP Document object and its semantics;
- 277 2. Define an attribute group tag for attributes of an IPP Document object;
- 278 3. Define attributes and values to describe an IPP Document object;
- 279 4. Define operations for querying and manipulating IPP Document objects;
- 280 5. Extend existing operations to explicitly create IPP Document objects;
- 281 6. Define security requirements necessary to support IPP Document objects; and
- 282 7. Define sections to register all objects, attribute groups, attributes, values, and
283 operations with IANA.
284

285 4. Model

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

290 4.1 Document Object

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



298

299

Figure 1 - Document Object Life Cycle

300 4.2 Operations

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

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

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

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

313 **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

314 4.3 Job and Document Template Attributes

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

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

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

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

331 **5. New Operations**

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

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

336 **5.1 Document Operations**

337 **5.1.1 Cancel-Document**

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

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

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

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

356

357

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'

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

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

365 5.1.1.1 Cancel-Document Request

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

367 Group 1: Operation Attributes

368 Natural Language and Character Set:

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

371 Target:

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

378 Requesting User Name:

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

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

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

386 5.1.1.2 Cancel-Document Response

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

388 Group 1: Operation Attributes

389 Status Message:

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

394 Natural Language and Character Set:

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

397 Group 2: Unsupported Attributes

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

399 5.1.2 Get-Document-Attributes

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

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

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

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

410 '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-Document-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-Document-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-Document-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-Document-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-Document-Attributes operation, then it SHOULD support
 504 setting of all Document Description and Document Template attributes that the

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

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

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

521 **5.1.3.1 Set-Document-Attributes Request**

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

523 Group 1: Operation Attributes

524 Natural Language and Character Set:

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

527 Target:

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

534 Requesting User Name:

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

537 Group 2: Document Attributes

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

543 5.1.3.2 Set-Document-Attributes Response

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

546 Group 1: Operation Attributes

547 Status Message:

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

552 Natural Language and Character Set:

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

555 Group 2: Unsupported Attributes

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

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

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

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

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

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

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

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

586 5.2 Job Operations

587 5.2.1 Get-Documents

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

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

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

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

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

606 5.2.1.1 Get-Documents Request

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

608 Group 1: Operation Attributes

609 Natural Language and Character Set:

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

611 Target:

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

615 Requesting User Name:

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

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

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

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

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

635 5.2.1.2 Get-Documents Response

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

637 Group 1: Operation Attributes

638 Status Message:

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

643 Natural Language and Character Set:

644 The "attributes-charset" and "attributes-natural-language" attributes as
645 described in [STD92].

646 Group 2: Unsupported Attributes

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

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

655 Groups 3 to N: Document Attributes

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

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

668 **6. New Attributes**669 **6.1 Document Description Attributes**670 **6.1.1 document-name (name(MAX))**

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

674 **6.2 Document Status Attributes**

675 Table 4 lists the Document Status attributes defined by this specification. Printers that
 676 support a given operation or Job Status attribute MUST support the corresponding
 677 Document Status attribute.

678

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]

679 Note 1: The "document-state" attribute supports all of the "job-state" values *except*
680 '4' (pending-held).

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

684 6.2.1 document-charset (charset)

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

689 6.2.2 document-format-detected (mimeMediaType)

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

692 6.2.3 document-message (text(MAX))

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

699 6.2.4 document-number (integer(1:MAX))

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

703 6.2.5 last-document (boolean)

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

709 6.3 Document Template Attributes

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

712 **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]

713 6.4 Operation Attributes

714 6.4.1 document-charset (charset)

715 This RECOMMENDED operation attribute specifies the character set used by the Document
716 data.

717 6.4.2 document-number (integer(1:MAX))

718 This REQUIRED operation attribute specifies the ordinal number of the Document within the
719 Job.

720 **6.5 Printer Description Attributes**

721 **6.5.1 document-creation-attributes-supported (1setOf type2 keyword)**

722 This REQUIRED attribute lists the keyword names of the Document Template and operation
723 attributes that the Printer will accept in the Send-Document and Send-URI Document
724 Creation operations. Implementations that support the Send-URI operation MUST include
725 the ‘document-uri’ keyword in “document-creation-attributes-supported”. Implementations
726 that do not support Send-URI MUST NOT include the ‘document-uri’ keyword in “document-
727 creation-attributes-supported”.

728 Note: The “document-uri” attribute is specific to the Send-URI operation. Inclusion of the
729 ‘document-uri’ keyword in “document-creation-attributes-supported” does not imply that the
730 “document-uri” attribute is valid for the Send-Document operation.

731 **7. New Attribute Group Tags**

732 **7.1 document-attributes-tag**

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

735

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

737 **8.1 Cancel-Job: "document-state" and "document-state-reasons"**

738 This REQUIRED operation sets the “document-state” Document Status attribute to
739 ‘canceled’ and the “document-state-reasons” Document Status attribute with ‘canceled-by-
740 user’ or ‘canceled-by-operator’ for *all* Document objects in the identified Job that have not
741 yet reached a terminating state (‘completed’, ‘canceled’, or ‘aborted’).

742 **8.2 Hold-Job and Release-Job: "document-state-reasons"**

743 These OPTIONAL operations affect the state of the target Job. The values of the
744 Documents’ “document-state-reasons” Document Status attributes MUST NOT be affected
745 by these operations.

746 **8.3 Print-Job, Print-URI: Document Object and Attributes**

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

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

753 **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

754

755

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

756 **8.3.1 Print-Job/Print-URI Response**

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

758 Group 1: Operation Attributes

759 As specified in [STD92].

760 Group 2: Unsupported Attributes

761 As specified in [STD92].

762 Group 3: Job Object Attributes

763 As specified in [STD92].

764 Group 4: Document Object Attributes (new)

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

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

768 "document-state" (type1 enum):

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

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

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

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

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

775 8.4 Send-Document: Document Object and Attributes

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

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

783 Finally, Printers also return the attributes listed in

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

785 **8.4.1 Send-Document Request**

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

787 Group 1: Operation Attributes

788 As specified in [STD92].

789 Group 2: Document Template Attributes (new)

790 The Client OPTIONALLY supplies and the Printer MUST support a set of
791 Document Template attributes. If the Client is not supplying any Document
792 Template attributes in the request, the Client SHOULD omit Group 2 rather
793 than sending an empty group. However, a Printer MUST be able to accept
794 an empty group.

795 Group 3: Document Data

796 As specified in [STD92].

797 **8.4.2 Send-Document Response**

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

799 Group 1: Operation Attributes

800 As specified in [STD92].

801 Group 2: Unsupported Attributes

802 As specified in [STD92].

803 Group 3: Job Object Attributes

804 As specified in [STD92].

805 Group 4: Document Object Attributes (new)

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

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

809 "document-state" (type1 enum):

- 810 The Printer MUST return the state of this Document object.
- 811 "document-state-reasons" (1setOf type2 keyword):
- 812 The Printer MUST return the associated state reasons for this Document.
- 813 "document-state-message" (text(MAX)):
- 814 The Printer MAY return the localized description of the "document-state" and
815 "document-state-reasons" values for this Document.

816 **8.5 Send-URI: Document Object and Attributes**

- 817 This specification extends the OPTIONAL Send-URI operation [STD92] to explicitly create
818 a Document object and copy the operation attributes listed in Table 6 to the corresponding
819 Document attributes.
- 820 The Send-URI request is also extended to support an additional Document Template
821 attribute group after the operation attribute group. Document Template attributes are copied
822 to the Document object after validation as described in section 4.3. Printers MUST NOT
823 copy Document Template attributes to the Job object.
824 Finally, Printers also return the attributes listed in

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

826 **8.5.1 Send-URI Request**

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

828 Group 1: Operation Attributes

829 As specified in [STD92].

830 Group 2: Document Template Attributes (new)

831 The Client OPTIONALLY supplies and the Printer MUST support a set of
832 Document Template attributes. If the Client is not supplying any Document
833 Template attributes in the request, the Client SHOULD omit Group 2 rather
834 than sending an empty group. However, a Printer MUST be able to accept
835 an empty group.

836 **8.5.2 Send-URI Response**

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

838 Group 1: Operation Attributes

839 As specified in [STD92].

840 Group 2: Unsupported Attributes

841 As specified in [STD92].

842 Group 3: Job Object Attributes

843 As specified in [STD92].

844 Group 4: Document Object Attributes (new)

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

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

848 "document-state" (type1 enum):

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

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

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

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

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

855 9. Additional Values for Existing Attributes

856 9.1 operations-supported (1setOf type2 enum)

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

858 **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

859 9.2 requested-attributes (1setOf type2 keyword)

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

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

863 'document-template': All Document Template and Printer "xxx-supported" attributes.
864

865 10. Obsolete Operations and Attributes

866 10.1 Obsolete Delete-Document Operation

867 The OBSOLETE Delete-Document operation removes the specified Document object and
 868 its data immediately from the specified Job. This operation is OBSOLETE because it
 869 destroys accounting information about the target Document and MUST NOT be supported
 870 by new implementations of this specification.

871 10.2 Obsolete Document Status Attributes

872 Table 9 lists the OBSOLETE Document Status attributes that were defined in the previous
 873 version of this specification [PWG5100.5-2003].

874 Note: This specification does not change the status of the original operation or Job Status
 875 attributes that have the same names.

876 **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]

877 11. Conformance Requirements

878 11.1 Printer Conformance Requirements

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

- 880 1. The required operations defined in section 5;
- 881 2. The required attributes and values defined in section 6;
- 882 3. The new attribute group tag defined in section 7;
- 883 4. The additional semantics defined in section 8;
- 884 5. The additional values defined in section 9;

- 885 6. The internationalization considerations defined in section 12; and
886 7. The security considerations defined in section 13.

887 **11.2 Client Conformance Requirements**

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

- 889 1. The required operations defined in section 5;
890 2. The required attributes and values defined in section 6;
891 3. The new attribute group tag defined in section 7;
892 4. The additional values defined in section 9;
893 5. The internationalization considerations defined in section 12; and
894 6. The security considerations defined in section 13.

895 **12. Internationalization Considerations**

896 For interoperability and basic support for multiple languages, conforming implementations
897 MUST support:

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

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

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

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

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

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

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

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

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

917 Unicode Collation Algorithm [UTS10] – sorting

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

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

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

922 Unicode Character Property Model [UTR23] – character properties

923 Unicode Conformance Model [UTR33] – Unicode conformance basis

924 **13. Security Considerations**

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

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

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

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

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

933 **14. IANA Considerations**

934 **14.1 Attribute Registrations**

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

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

938 The registry entries will contain the following information:

939	Document Description attributes:	Reference
940	-----	-----
941	document-name (name (MAX))	[PWG5100.5]

942	Document Status attributes:	Reference
943	-----	-----
944	attributes-charset (charset)	[PWG5100.5]
945	attributes-natural-language (naturalLanguage)	[PWG5100.5]
946	compression(obsolete) (type2 keyword)	[PWG5100.5]
947	current-page-order (type2 keyword)	[PWG5100.5]
948	date-time-at-completed (dateTime)	[PWG5100.5]
949	date-time-at-created (dateTime)	[PWG5100.5]
950	date-time-at-processing (dateTime)	[PWG5100.5]
951	detailed-status-messages (1setOf text(MAX))	[PWG5100.5]
952	document-access-errors (1setOf text(MAX))	[PWG5100.5]
953	document-charset (charset)	[PWG5100.5]
954	document-digital-signature(obsolete) (type2 keyword)	[PWG5100.5]
955	document-format (mimeMediaType)	[PWG5100.5]
956	document-format-details(obsolete) (1setOf collection)	[PWG5100.5]
957	document-format-details-detected(obsolete) (1setOf collection)	[PWG5100.5]
958		[PWG5100.5]
959	document-format-detected (mimeMediaType)	[PWG5100.5]
960	document-format-version(obsolete) (text(127))	[PWG5100.5]
961	document-format-version-detected(obsolete) (text(127))	[PWG5100.5]
962	document-job-id (integer(1:MAX))	[PWG5100.5]
963	document-job-uri (uri)	[PWG5100.5]
964	document-message (text(MAX))	[PWG5100.5]
965	document-natural-language (naturalLanguage)	[PWG5100.5]
966	document-number (integer(1:MAX))	[PWG5100.5]
967	document-printer-uri (uri)	[PWG5100.5]
968	document-state (type1 enum)	[PWG5100.5]
969	document-state-message (text(MAX))	[PWG5100.5]
970	document-state-reasons (1setOf type2 keyword)	[PWG5100.5]
971	document-uri (uri)	[PWG5100.5]
972	impressions (integer(0:MAX))	[PWG5100.5]
973	impressions-completed (integer(0:MAX))	[PWG5100.5]
974	impressions-completed-current-copy(obsolete) (integer(0:MAX))	[PWG5100.5]
975		[PWG5100.5]
976	k-octets (integer(0:MAX))	[PWG5100.5]
977	k-octets-processed (integer(0:MAX))	[PWG5100.5]
978	last-document (boolean)	[PWG5100.5]
979	media-sheets (integer(0:MAX))	[PWG5100.5]
980	media-sheets-completed (integer(0:MAX))	[PWG5100.5]
981	more-info (uri)	[PWG5100.5]
982	output-device-assigned (name(MAX))	[PWG5100.5]
983	printer-up-time (integer(1:MAX))	[PWG5100.5]
984	sheet-completed-copy-number(obsolete) (integer(0:MAX))	[PWG5100.5]
985	time-at-completed (integer(MIN:MAX))	[PWG5100.5]
986	time-at-creation (integer(MIN:MAX))	[PWG5100.5]
987	time-at-processing (integer(MIN:MAX))	[PWG5100.5]
988		[PWG5100.5]
989		
990	Document Template attributes:	Reference
991	-----	-----
992	copies (integer(1:MAX))	[PWG5100.5]
993	cover-back (collection)	[PWG5100.5]
994	<Member attributes are the same as the "cover-back" Job Template	
995	attribute>	[PWG5100.5]
996	cover-front (collection)	[PWG5100.5]


```

997     <Member attributes are the same as the "cover-front" Job Template
998     attribute> [PWG5100.5]
999     finishings (1setOf type2 enum) [PWG5100.5]
1000    finishings-col (1setOf collection) [PWG5100.5]
1001     <Member attributes are the same as the "finishings-col" Job Template
1002     attribute> [PWG5100.5]
1003    force-front-side (1setOf integer(1:MAX)) [PWG5100.5]
1004    imposition-template (type2 keyword | name(MAX)) [PWG5100.5]
1005    media (type2 keyword | name(MAX)) [PWG5100.5]
1006    media-col (collection) [PWG5100.5]
1007     <Member attributes are the same as the "media-col" Job Template
1008     attribute> [PWG5100.5]
1009    media-input-tray-check (type2 keyword | name(MAX)) [PWG5100.5]
1010    number-up (integer(1:MAX)) [PWG5100.5]
1011    orientation-requested (type2 enum) [PWG5100.5]
1012    output-bin (type2 keyword | name(MAX)) [PWG5100.5]
1013    page-delivery (type2 keyword) [PWG5100.5]
1014    page-order-received (type2 keyword) [PWG5100.5]
1015    page-ranges (1setOf rangeOfInteger(1:MAX)) [PWG5100.5]
1016    presentation-direction-number-up (type2 keyword) [PWG5100.5]
1017    print-quality (type2 enum) [PWG5100.5]
1018    printer-resolution (resolution) [PWG5100.5]
1019    sides (type2 keyword) [PWG5100.5]
1020    x-image-position (type2 keyword) [PWG5100.5]
1021    x-image-shift (integer(MIN:MAX)) [PWG5100.5]
1022    x-sidel1-image-shift (integer(MIN:MAX)) [PWG5100.5]
1023    x-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1024    y-image-position (type2 keyword) [PWG5100.5]
1025    y-image-shift (integer(MIN:MAX)) [PWG5100.5]
1026    y-sidel1-image-shift (integer(MIN:MAX)) [PWG5100.5]
1027    y-side2-image-shift (integer(MIN:MAX)) [PWG5100.5]
1028
1029    Operation attributes: Reference
1030    -----
1031    document-charset (charset) [PWG5100.5]
1032    document-number (integer(1:MAX)) [PWG5100.5]
1033
1034    Printer Description attributes: Reference
1035    -----
1036    document-creation-attributes-supported (1setOf type2 keyword)
1037    [PWG5100.5]

```

1038 14.2 Attribute Value Registrations

1039 The attribute values defined in this specification will be published by IANA according to the
1040 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1041 <http://www.iana.org/assignments/ipp-registrations>

1042 The registry entries will contain the following information:

1043	Attributes (attribute syntax)	
1044	Keyword Attribute Value	Reference

1045	-----	-----
1046	requested-attributes (1setOf type2 keyword)	[STD92]
1047	document-description	[PWG5100.5]
1048	document-template	[PWG5100.5]

1049 14.3 Type2 enum Registrations

1050 The enum values defined in this specification will be published by IANA according to the
1051 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1052 <http://www.iana.org/assignments/ipp-registrations>

1053 The registry entries will contain the following information:

1054	Attributes (attribute syntax)		
1055	Enum Value	Enum Symbolic Name	Reference
1056	-----	-----	-----
1057	operations-supported (1setOf type2 enum)		[STD92]
1058	0x0033	Cancel-Document	[PWG5100.5]
1059	0x0034	Get-Document-Attributes	{PWG5100.5}
1060	0x0035	Get-Documents	[PWG5100.5]
1061	0x0036	Delete-Document (obsolete)	[PWG5100.5]
1062	0x0037	Set-Document-Attributes	[PWG5100.5]
1063			

1064 14.4 Operation Registrations

1065 The operations defined in this specification will be published by IANA according to the
1066 procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

1067 <http://www.iana.org/assignments/ipp-registrations>

1068 The registry entries will contain the following information:

1069	Operation Name	Reference
1070	-----	-----
1071	Cancel-Document	[PWG5100.5]
1072	Cancel-Job (extension)	[PWG5100.5]
1073	Delete-Document (obsolete)	[PWG5100.5]
1074	Get-Document-Attributes	[PWG5100.5]
1075	Get-Documents	[PWG5100.5]
1076	Hold-Job (extension)	[PWG5100.5]
1077	Print-Job (extension)	[PWG5100.5]
1078	Print-URI (extension)	[PWG5100.5]
1079	Release-Job (extension)	[PWG5100.5]
1080	Send-Document (extension)	[PWG5100.5]
1081	Send-URI (extension)	[PWG5100.5]
1082	Set-Document-Attributes	[PWG5100.5]

1083 14.5 Attribute Group Registrations

1084 The attribute groups 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	Value	Attribute Group Name	Reference
1089	-----	-----	-----
1090	0x09	document-attributes-tag	[PWG5100.5]

1091 15. Overview of Changes

1092 15.1 IPP Document Object v1.1

1093 The following changes were made to the previous version of this specification [PWG5100.5-
1094 2003]:

- 1095 • Printers no longer need to support multiple Document Jobs, as the Document object
1096 and associated operations are useful even for single Document Jobs;
- 1097 • Rationale and model sections have been added;
- 1098 • References now point to the current versions of dependent documents and
1099 specifications at the time of publication;
- 1100 • The "document-charset" operation attribute has been added to this specification;
- 1101 • The Delete-Document operation has been made OBSOLETE because it destroys
1102 accounting information;
- 1103 • Additional semantics for the DEPRECATED Reprocess-Job and Restart-Job
1104 operations have been removed because those operations SHOULD NOT be
1105 implemented or used;
- 1106 • The "ipp-attribute-fidelity" and "job-mandatory-attributes" operation attributes are no
1107 longer promoted to persistent Job and Document attributes because they are only
1108 utilized during Job Creation;
- 1109 • The "compression" Document Status attribute has been made OBSOLETE because
1110 it serves no purpose;

- 1111 • The "document-digital-signature" Document Status attribute has been made
1112 OBSOLETE because it serves no purpose;
- 1113 • The "document-format-details", "document-format-details-detected", "document-
1114 format-version", and "document-format-version-detected" Document Status
1115 attributes have been made OBSOLETE because they have serious interoperability
1116 issues; and
- 1117 • The "impressions-completed-current-copy" and "sheet-completed-copy-number"
1118 Document Status attributes have been made OBSOLETE because the parent
1119 specification (RFC 3381) is OBSOLETE.

1120 16. References

1121 16.1 Normative References

- 1122 [BCP14] S. Bradner, "Key words for use in RFCs to Indicate Requirement
1123 Levels", RFC 2119/BCP 14, March 1997,
1124 <https://tools.ietf.org/html/bcp14>
- 1125 [ISO10646] "Information technology -- Universal Coded Character Set (UCS)",
1126 ISO/IEC 10646:2011
- 1127 [PWG5100.1] S. Kennedy, M. Sweet, "IPP Finishings 2.1", PWG 5100.1-2017,
1128 February 2017, [https://ftp.pwg.org/pub/pwg/candidates/cs-
1129 ippfinishings21-20170217-5100.1.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings21-20170217-5100.1.pdf)
- 1130 [PWG5100.2] T. Hastings, R. Bergman, "Internet Printing Protocol (IPP): 'output-bin'
1131 attribute extension", PWG 5100.2-2001, February 2001,
1132 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippoutputbin10-20010207-
1133 5100.2.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippoutputbin10-20010207-5100.2.pdf)
- 1134 [PWG5100.3] K. Ocke, T. Hastings, "Internet Printing Protocol (IPP): Production
1135 Printing Attributes - Set 1", PWG 5100.3-2001, February 2001,
1136 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-
1137 5100.3.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippprodprint10-20010212-5100.3.pdf)
- 1138 [PWG5100.11] T. Hastings, "Internet Printing Protocol (IPP): Job and Printer
1139 Extensions - Set 2 (JPS2)", PWG 5100.11-2010, October 2010,
1140 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext10-
1141 20101030-5100.11.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext10-20101030-5100.11.pdf)

- 1142 [RFC3380] T. Hastings, R. Herriot, C. Kugler, H. Lewis, "Internet Printing Protocol
1143 (IPP): Job and Printer Set Operations", RFC 3380, September 2002,
1144 <https://tools.ietf.org/html/rfc3380>
- 1145 [RFC3998] C. Kugler, H. Lewis, T. Hastings, "Internet Printing Protocol (IPP): Job
1146 and Printer Administrative Operations", RFC 3998, March 2005,
1147 <https://tools.ietf.org/html/rfc3998>
- 1148 [RFC5198] J. Klensin, M. Padlipsky, "Unicode Format for Network Interchange",
1149 RFC 5198, March 2008, <https://tools.ietf.org/html/rfc5198>
- 1150 [RFC7230] R. Fielding, J. Reschke, "Hypertext Transfer Protocol (HTTP/1.1):
1151 Message Syntax and Routing", RFC 7230, June 2014,
1152 <https://tools.ietf.org/html/rfc7230>
- 1153 [STD63] F. Yergeau, "UTF-8, a transformation format of ISO 10646", RFC
1154 3629/STD 63, November 2003, <https://tools.ietf.org/html/std63>
- 1155 [STD92] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1", STD 92, June
1156 2018, <https://tools.ietf.org/html/std92>
- 1157 [UAX9] Unicode Consortium, "Unicode Bidirectional Algorithm", UAX#9, May
1158 2018, <https://www.unicode.org/reports/tr9>
- 1159 [UAX14] Unicode Consortium, "Unicode Line Breaking Algorithm", UAX#14,
1160 May 2018, <https://www.unicode.org/reports/tr14>
- 1161 [UAX15] M. Davis, M. Duerst, "Unicode Normalization Forms", Unicode
1162 Standard Annex 15, May 2018, <https://www.unicode.org/reports/tr15>
- 1163 [UAX29] Unicode Consortium, "Unicode Text Segmentation", UAX#29, May
1164 2018, <https://www.unicode.org/reports/tr29>
- 1165 [UAX31] Unicode Consortium, "Unicode Identifier and Pattern Syntax",
1166 UAX#31, June 2018, <https://www.unicode.org/reports/tr31>
- 1167 [UNICODE] Unicode Consortium, "Unicode Standard", Version 11.0.0, June 2018,
1168 <https://www.unicode.org/versions/Unicode11.0.0/>
- 1169 [UTS10] Unicode Consortium, "Unicode Collation Algorithm", UTS#10, May
1170 2018, <https://www.unicode.org/reports/tr10>
- 1171 [UTS35] Unicode Consortium, "Unicode Locale Data Markup Language",
1172 UTS#35, March 2018, <https://www.unicode.org/reports/tr35>
- 1173 [UTS39] Unicode Consortium, "Unicode Security Mechanisms", UTS#39, May
1174 2018, <https://www.unicode.org/reports/tr39>

1175 16.2 Informative References

- 1176 [PWG5100.5-2003] D. Carney, T. Hastings, P. Zehler, "Standard for The Internet Printing
1177 Protocol (IPP): Document Object", PWG 5100.5-2003 (obsoleted by
1178 this specification), October 2003,
1179 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-
1180 5100.5.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-5100.5.pdf)
- 1181 [PWG5100.7-2003] T. Hastings, P. Zehler, "Standard for The Internet Printing Protocol
1182 (IPP): Job Extensions", PWG 5100.7-2003, October 2003,
1183 [https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext10-20031031-
1184 5100.7.pdf](https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext10-20031031-5100.7.pdf)
- 1185 [RFC3381-OBSOLETE]
1186 T. Hastings, H. Lewis, R. Bergman, "Internet Printing Protocol (IPP):
1187 Job Progress Attributes", RFC 3381 (obsoleted by RFC 8011),
1188 September 2002, <https://tools.ietf.org/html/rfc3381>
- 1189 [UTR17] Unicode Consortium "Unicode Character Encoding Model", UTR#17,
1190 November 2008, <https://www.unicode.org/reports/tr17>
- 1191 [UTR23] Unicode Consortium "Unicode Character Property Model", UTR#23,
1192 May 2015, <https://www.unicode.org/reports/tr23>
- 1193 [UTR33] Unicode Consortium "Unicode Conformance Model", UTR#33,
1194 November 2008, <https://www.unicode.org/reports/tr33>
- 1195 [UNISECFAQ] Unicode Consortium "Unicode Security FAQ", November 2013,
1196 <https://www.unicode.org/faq/security.html>

1197 17. Author's Address

1198 Primary author:

1199 Michael Sweet
1200 Apple Inc.
1201 One Apple Park Way
1202 MS 111-HOMC
1203 Cupertino CA 95014
1204 USA

1205 Send comments to the PWG IPP Mailing List:

1206 ipp@pwg.org (subscribers only)

1207 To subscribe, see the PWG web page:

1208 <http://www.pwg.org/>

1209 Implementers of this specification are encouraged to join the IPP Mailing List in order to
1210 participate in any discussions of clarification issues and review of registration proposals for
1211 additional attributes and values.

1212 The editors would like to especially thank the following individuals who also contributed
1213 significantly to the development of this specification:

1214 Dennis Carney (author of v1.0)
1215 Tom Hastings (author of v1.0)
1216 Ira McDonald (High North, Inc.)
1217 Peter Zehler (author of v1.0)

1218 **18. Change History**

1219 **18.1 March 18, 2019**

- 1220 • Stable: Stable
- 1221 • Section 2.1: Added definitions of DEPRECATED and OBSOLETE
- 1222 • Section 3.1: Added forward reference to section 15
- 1223 • Section 15: Updated with rationale
- 1224 • Global: "obsolete" and "deprecated" are now "OBSOLETE" and "DEPRECATED"
- 1225 •

1226 **18.2 January 29, 2019**

- 1227 • Status: Prototype
- 1228 • Fixed broken references throughout
- 1229 • Section 10.2: Say "operation and Job Status" instead of "non-document"

1230 18.3 October 22, 2018

- 1231 • Status: Interim.
- 1232 • Section 4: Changed to use "This specification" instead of "This document".
- 1233 • Figure 1: Updated with the list of operations.
- 1234 • Table 1: Added target object.
- 1235 • Editorial changes throughout.
- 1236 • Updated wording of the access rights section, per WG review comments on October
1237 11, 2018
- 1238 • Table 9: Changed "Reference" column title to "Origin"
- 1239 • Updated references to the old PWG 5100.5 and 5100.7 to include the year, note they
1240 are obsolete.
- 1241 • Updated RFC 3381 to note it is obsolete, obsoleted by RFC 8011

1242 18.4 September 19, 2018

- 1243 • Initial revision for v1.1.
- 1244 • Updated to use new working draft template, section organizations.
- 1245 • Updated references.
- 1246 • Added Changes section.
- 1247 • Added proper rationale and model sections.
- 1248 • Printers no longer need to support multiple Document Jobs.
- 1249 • Added the "document-charset" operation attribute from PWG 5100.7.
- 1250 • Made the Delete-Document operation obsolete.
- 1251 • Made the "compression" Document Status attribute obsolete because it serves no
1252 purpose.
- 1253 • Made several "document-format-xxx" Document Status attributes from PWG 5100.7
1254 obsolete because they have serious interoperability issues.

1255
1256
1257

- Made the "impressions-completed-current-copy" and "sheet-completed-copy-number" Document Status attributes obsolete because the parent specification (RFC 3381) is obsolete.