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PWG Working Draft

The Printer Working Group (PWG)
Proposed Standard for
The Internet Printing Protocol (IPP):
Document Object

97 ISSUES are highlighted like this, some are in footnotes.



Version 0.65, ~~October 25, 2002~~ January 13, 2003

The Printer Working Group (PWG) Proposed Standard for The Internet Printing Protocol (IPP): Document Object

Version 0.65, ~~October 25, 2002~~ January 13, 2003

Abstract: This IPP specification extends the IPP Model and Semantics [RFC2911] object model by defining a Document object. The [RFC2911] Job object is extended to contain one or more Document objects which are passive objects operated on by the Job. The Document object is created by the **REQUIRED** [RFC2911] Send-Document and **OPTIONAL** Send-URI operations and represents an Input Document to the Job. This specification also adds a Document Attributes group (and tag) to these Send-Document and Send-URI requests. The Document Attributes group contains any Document Template attributes to be applied to this Document object being created, overriding any corresponding Job Template attribute supplied at the job level (including the "document-overrides" operation attributes at the Job or Document level). A new **REQUIRED** Create-Document operation allows a client to supply the Document Attributes without the data (like Create-Job does for a Job object). Then the client sends the data content to that Document object using the new **REQUIRED** Send-Data operation. The client can also supply Document Attributes with the existing Send-Document and Send-URI operations to create Document objects with content data or a document reference, respectively.

This specification also defines ~~seven~~ **five** new operations for Document objects once they have been created:
3 REQUIRED: ~~Cancel-Current-Document~~, Cancel-Document, Get-Document-Attributes, Get-Documents,
2 OPTIONAL: Delete-Document, Set-Document-Attributes, ~~and Validate-Document~~.

This specification also lists all of the attributes defined in other IPP specifications to show their relationship to corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the "document-state", "document-state-reasons", and "document-state-message" Document Description attributes are given along side of the corresponding [RFC2911] "job-state", "job-state-reasons", and "job-state-message" Job Description attributes. A number of Job Description attributes, such as "time-at-completed" and "time-at-creation", have corresponding Document Description attributes defined. A number of Document Creation operation attributes, such as "attributes-charset" and "document-format", have corresponding Document Description attributes defined.

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

This version of the PWG Proposed Standard is available electronically at:

ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/pwg-ipp-document-object-v065-030113021025.pdf, .doc, .rtf

This document is **a Working Draft of** an IEEE-ISTO PWG Proposed ~~s~~Standard **after a PWG Last Call**. For a definition of a "PWG Proposed Standard" and its transition to a "PWG Draft Standard" **and a "PWG Standard"**, see: <ftp://ftp.pwg.org/pub/pwg/general/pwg-process.pdf>. After approval by the PWG (by a Last Call) to transition this **PWG Working Draft to a PWG** Proposed Standard ~~to a Draft Standard~~, an IEEE-ISTO number will be assigned and **theis resulting** PWG **Draft-Proposed** Standard will be available electronically at:

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106 providers, network operating systems providers, network connectivity vendors, and print management application
107 developers. The group is chartered to make printers and the applications and operating systems supporting them
108 work together better. All references to the PWG in this document implicitly mean "The Printer Working Group, a
109 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open
110 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
111 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
112 standards.

113 In general, a PWG standard is a specification that is stable, well understood, and is technically competent, has
114 multiple, independent and interoperable implementations with substantial operational experience, and enjoys
115 significant public support.

116 For additional information regarding the Printer Working Group visit: <http://www.pwg.org>

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120 IPP Web Page: <http://www.pwg.org/ipp/>

121 IPP Mailing List: ipp@pwg.org

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123 1) send it to majordomo@pwg.org

124 2) leave the subject line blank

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

126 subscribe ipp

127 end

128 Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
129 discussions of clarifications or review of registration proposals for additional names. Requests for additional [media](#)
130 [names](#)[extensions](#), for inclusion in this specification, should be sent to the IPP Mailing list for consideration. In order
131 to reduce spam the mailing list rejects mail from non-subscribers, so you must subscribe to the mailing list in order to
132 send a question or comment to the mailing list.

133

133 **Contents**

134 1 Introduction and Summary 9

135 1.1 Scope 9

136 2 Terminology 10

137 2.1 Conformance Terminology..... 10

138 2.2 Other Terminology 11

139 3 Document Operations 12

140 3.1 Create-Document Operation..... 13

141 3.1.1 Create-Document Request..... 14

142 3.1.1.1 input-document-number (integer(1:MAX)) **DEPRECATED** 15

143 3.1.1.2 last-document (boolean) 15

144 3.1.1.3 document-message (text(MAX)) 16

145 3.1.1.4 Additional Operation attributes:..... 16

146 3.1.1.5 Ignoring unsupported or improper operation attributes:..... 16

147 3.1.2 Create-Document Response 17

148 3.1.2.1 document-number (integer(1:MAX)) 18

149 3.1.2.2 document-id-uri (uri)..... 18

150 3.1.2.3 document-state (type1 enum) 18

151 3.1.2.4 document-state-reasons (1setOf type2 keyword) 18

152 3.1.2.5 document-state-message (text(MAX)) 18

153 3.2 Send-Data Operation 18

154 3.2.1 Send-Data request 19

155 3.2.2 Send-Data Response 19

156 3.3 Send-Document Operation 20

157 3.3.1 Send-Document Request 20

158 3.3.2 Send-Document Response 21

159 3.4 Send-URI Operation 21

160 3.5 Get-Document-Attributes Operation 22

161 3.5.1 Get-Document-Attributes Request 23

162 3.5.1.1 "requested-attributes" (1setOf keyword): 23

163 3.5.2 Get-Document-Attributes Response 24

164 3.6 Get-Documents Operation 24

165 3.6.1 Get-Documents Request 25

166 3.6.1.1 "limit" (integer(1:MAX)):..... 25

167 3.6.1.2 "requested-attributes" (1setOf type2 keyword): 25

168 3.6.2 Get-Documents Response 25

169 3.7 Set-Document-Attributes Operation..... 26

170 3.7.1 Settable and READ-ONLY Document Description attributes 28

171 3.7.2 Set-Document-Attributes Request..... 28

172 3.7.3 Set-Document-Attributes Response 29

173 3.8 Cancel-Document Operation 30

174 3.8.1 Cancel-Document Request 31

175 3.8.1.1 document-message (text(MAX)) operation attribute 31

176 3.8.2 Cancel-Document Response..... 31

177 3.9 Delete-Document Operation 33

178 4 Semantic extensions to Job operations..... 33

179 4.1 Cancel-Current-Job ([adm-ops] section 4.2)..... 34

180 4.2 Cancel-Job ([RFC2911] section 3.3.3) 34

181 4.3 Job Creation operations..... 34

182 4.3.1 ipp-attribute-fidelity (boolean) ([RFC2911] section 3.2.1 and 15) 34

183 4.3.2 job-mandatory-attributes (1setOf type2 keyword) operation attribute 34

184 4.3.3 Create-Job ([RFC2911] section 3.2.4) 35

185 4.3.4 Print-Job ([RFC2911] section 3.2.1) 35

186 4.3.5 Print-URI ([RFC2911] section 3.2.2) 36

187 4.4 Purge-Jobs ([RFC2911] section 3.2.9) 36

188 4.5 Release-Job ([RFC2911] section 3.3.6) 36

189 4.6 Reprocess-Job ([adm-ops] section 4.1)..... 36

190 4.7 Restart-Job ([RFC2911] section 3.3.7) 36

191 4.8 Send-Document ([RFC2911] section 3.3.1)..... 36

192 4.9 Send-URI ([RFC2911] section 3.3.2) 36

193 4.10 Suspend-Current-Job ([adm-ops] section 4.3.1) 37

194 5 Attribute Precedence during job processing..... 37

195 6 Operation Attributes for the Job and Document Creation operations 39

196 6.1 Operation Attributes supplied at the Job and Document Levels for Creation..... 39

197 6.2 Override operation attributes in Send-Document and Send-URI 41

198 6.3 Operation Attributes returned in Job and Document Creation responses 41

199 7 Job Template and Document Template attributes 42

200 7.1 Job Template attributes defined for use with multi-document jobs..... 49

201 7.1.1 job-copies (integer(1:MAX))..... 49

202 7.1.2 job-cover-back (collection)..... 49

203 7.1.3 job-cover-front (collection) 49

204 7.1.4 job-finishings (1setOf type2 enum)..... 50

205 7.1.5 job-finishings-col (1setOf collection)..... 50

206 7.1.6 media-size-name (type3 keyword | name(MAX)) 50

207 7.2 Document Template attributes..... 50

208 8 Job Description and Document Description attributes 50

209 8.1 Job Description attributes 53

210 8.1.1 ipp-attribute-fidelity (boolean) 53

211 8.1.2 job-mandatory-attributes (1setOf type2 keyword) 53

212 8.2 Document Description attributes..... 54

213 8.2.1 attributes-charset (charset)..... 54

214 8.2.2 attributes-natural-language (naturalLanguage) 54

215 8.2.3 compression (type3 keyword)..... 54

216 8.2.4 current-page-order (type2 keyword) 54

217 8.2.5 date-time-at-completed (dateTime) 54

218 8.2.6 date-time-at-creation (dateTime) 54

219 8.2.7 date-time-at-processing (dateTime) 55

220 8.2.8 document-format (mimeMediaType) 55

221 8.2.9 document-format-detail (collection) 55

222 8.2.9.1 document-format (mimeMediaType) 55

223 8.2.9.2 document-format-version (text(127)) 55

224 8.2.9.3 document-format-natural-languages (1setOf naturalLanguage)..... 55

225 8.2.9.4 platform (type3 keyword | name(MAX)) 56

226 8.2.9.5 device-id (text(127)) 56

227 8.2.9.6 document-format-details (1setOf collection) 56

228 8.2.10 document-format-detected (mimeMediaType) 56

229 8.2.11 document-id-uri (uri) 56

230 8.2.12 document-message (text(MAX)) 57

231 8.2.13 document-name (name(MAX)) 57

232 8.2.14 document-natural-language (naturalLanguage) 57

233 8.2.15 document-number (integer(1:MAX)) 57

234 8.2.16 document-state (type1 enum) and job-state (type1 enum) 57

235 8.2.16.1 The “job-state” Job Description attribute and the Job Life Cycle 59

236 8.2.16.2 The “document-state” Document Description attribute and the Document object life Cycle 60

237 8.2.16.3 Forwarding Servers 61

238 8.2.16.4 Partitioning of Job/Document States 61

239 8.2.17 document-state-message (text(MAX)) and job-state-message (text(MAX)) 62

240 8.2.18 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf type2 keyword) 62

241 8.2.19 document-uri (uri) 68

242 8.2.20 impressions-completed-current-copy (integer(0:MAX)) 68

243 8.2.21 [job-]detailed-status-message (1setOf text (MAX)) 68

244 8.2.22 [job-]document-access-errors (1setOf text(MAX)) 68

245 8.2.23 job-id (integer(1:MAX)) 69

246 8.2.24 [job-]impressions (integer(0:MAX)) 69

247 8.2.25 [job-]impressions-completed (integer(0:MAX)) 69

248 8.2.26 [job-]k-octets (integer(0:MAX)) 69

249 8.2.27 [job-]k-octets-processed (integer(0:MAX)) 69

250 8.2.28 [job-]media-sheets (integer(0:MAX)) 69

251 8.2.29 [job-]media-sheets-completed (integer(0:MAX)) 69

252 8.2.30 [job-]more-info (uri) 69

253 8.2.31 [job-]printer-up-time (integer (1:MAX)) 69

254 8.2.32 job-printer-uri (uri) 70

255 8.2.33 job-uri (uri) 70

256 8.2.34 [job-]warnings-count (integer(0:MAX)) 70

257 8.2.35 last-document (boolean) 70

258 8.2.36 output-device-assigned (name(127)) 70

259 8.2.37 sheet-completed-copy-number (integer(0:MAX)) 70

260 8.2.38 time-at-completed (integer (MIN:MAX)) 70

261 8.2.39 time-at-creation (integer (MIN:MAX)) 70

262 8.2.40 time-at-processing (integer (MIN:MAX)) 70

263 9 Printer attributes 71

264 9.1 document-creation-attributes-supported (1setOf type2 keyword) 76

265 9.2 printer-state-reasons (1setOf type2 keyword) 77

266 10 New Values for Existing Printer Description Attributes 80

267 10.1 operations-supported (1setOf type2 enum) 80

268 11 Conformance Requirements 80

269 11.1 Printer conformance requirements 80

270 11.2 Client conformance requirements 81

271 12 Normative References 81

272 13 Informative References 83

273 14 IANA Considerations 84

274 14.1 Attribute Registrations..... 84

275 14.2 Additional Enum Attribute Value Registrations 87

276 14.3 Operation Registrations 88

277 15 Internationalization Considerations 88

278 16 Security Considerations..... 88

279 17 Contributors 88

280 18 Acknowledgments..... 89

281 19 Author’s Address 89

282 20 Appendix A: Document operations compared to Job operations 89

283 21 Annex B: Change Log (informative) 90

284

285 **Table of Tables**

286 Table 1 - List of Document operations 10

287 Table 2 - Job Creation and Document Creation operations..... 12

288 Table 3 - Client-supplied Document Creation and Validation Request Signatures 13

289 Table 4 - Printer-returned Document Creation and Validation Response Signatures 13

290 Table 5 - Document State Table for the Set-Documents-Attributes operation 27

291 Table 6 - Operation Attributes supplied at the Job and Document Levels in Creation Requests..... 40

292 Table 7 - Operation attributes returned in Job and Document Creation operation *responses* 41

293 Table 8 - Job Template and Document Template attributes..... 43

294 Table 9 - Job and Document Description attributes..... 51

295 Table 10 - "document-format-detail" member attributes 55

296 Table 11 - "job-state" and "document-state" attribute values..... 58

297 Figure 1 - The “job-state” Job Description attribute and the Job object life cycle 60

298 Figure 2 - The “document-state” Document Description attribute and the Document object life Cycle..... 61

299 Table 12 - "job-state-reasons" and "document-state-reasons" attribute values 63

300 Table 13 - Printer attributes (Job Template and Printer Description) 72

301 Table 14 – Operation-id assignments 80

302 Table 15 - Document operations compared to Job operations 89

303

304 **Table of Figures**

305 Figure 1 - The “job-state” Job Description attribute and the Job object life cycle 60

306 Figure 2 - The “document-state” Document Description attribute and the Document object life Cycle..... 61

307

308

309 1 Introduction and Summary

310 This IPP specification extends the IPP Model and Semantics [RFC2911] object model by defining a Document
311 object. The [RFC2911] Job object is extended to contain one or more Document objects which are passive objects
312 operated on by the Job. The Document object is created by the [RFC2911] Send-Document and Send-URI
313 operations and represents an Input Document to the Job. This specification also adds a Document Attributes group
314 (and tag) to these Send-Document and Send-URI requests. The Document Attributes group contains any Document
315 Template attributes to be applied to this Document object being created, overriding any corresponding Job Template
316 attribute supplied at the job level (including the “document-overrides” operation attributes [\[override\]](#) at the Job or
317 Document level). A new Create-Document operation allows a client to supply the Document Attributes without the
318 data (like Create-Job does for a Job object). Then the client can send the data content to that Document object
319 using the new Send-Data operation.

320 This specification also defines seven new operations for Document objects once they have been created: [Cancel-](#)
321 [Current-Document](#), [Cancel-Document](#), [Get-Document-Attributes](#), [Get-Documents](#), [Delete-Document](#), [Set-Document-](#)
322 [Attributes](#), and [Validate-Document](#).

323 This specification also lists all of the attributes defined in other IPP specifications¹ to show their relationship to
324 corresponding attributes defined in this IPP specification for use with the Document object. The full semantics of the
325 “document-state”, “document-state-reasons”, and “document-state-message” Document Description attributes are
326 given along side of the corresponding [RFC2911] “job-state”, “job-state-reasons”, and “job-state-message” Job
327 Description attributes.

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

332 1.1 Scope

333 Part of the extension is to allow the client to supply printing instructions, called Document Template attributes, when
334 creating each Document object. An IPP Printer object implementation MAY support most of the existing Job
335 Template attributes as Document Template attributes as well. (The PWG Semantic Model [pwg-sm] currently calls
336 the Job Template attributes and Document Template attributes simply “Job Processing” and “Document Processing”
337 attributes). Note: There are a number of footnotes which relate this IPP specification to the PWG Semantic model
338 and other PWG projects, such as the Print Service Interface (PSI) [pwg-psi].

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

¹ [This specification lists all attributes defined in other IPP specifications at the time of publication of this specification. No attempt will be made to keep this specification up to date after publication.](#)

² The Document object is *not* a sub-job. If Job trees are desired where sub-jobs can be on different network nodes, such as in JDF, then a separate specification should be generated for Job trees.

343

Table 1 - List of Document operations

Operation Name	Printer support	Brief Description
Create-Document ³	REQUIRED	Creates a Document object with Document attributes, but no data.
Send-Data	REQUIRED	Sends data to the Document object created by Create-Document.
Send-Document *	REQUIRED	Creates a Document object with Document attributes and data.
Send-URI *	OPTIONAL	Creates a Document object with Document attributes and a URL reference to the data (print-by-reference).
Validate-Document	REQUIRED	Validate that the supplied Document attributes are supported.
Get-Document-Attributes	REQUIRED	Get requested attributes of specified Document in the specified Job.
Get-Documents	REQUIRED	Get requested attributes of all of the Documents in the specified Job.
Set-Document-Attributes	OPTIONAL	Set the supplied Document attributes on the specified Document.
Cancel-Document	REQUIRED	Cancel the specified Document in the specified Job, but don't remove it.
Cancel-Current-Document	OPTIONAL	Cancel the current document that the Printer is printing.
Delete-Document	OPTIONAL	Remove the specified Document object and its data from the Job.

344

* The existing IPP/1.1 operations defined in [RFC2911] with an extension so the client can supply Document

345

Template attributes in a new attribute Group in the request.

346

This specification also specifies the life cycle of the Document object by defining the "document-state", "document-

347

state-reasons", and "document-state-message" attributes. Finally, the analogous Document Descriptions attributes

348

that correspond to the Job Description attributes are defined.

349

2 Terminology

350

This section defines terminology used throughout this document.

351

2.1 Conformance Terminology

352

Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**, **NEED NOT**, and

353

OPTIONAL, have special meaning relating to conformance as defined in RFC 2119 [RFC2119] and [RFC2911]

354

section 12.1. If an implementation supports the extension defined in this document, then these terms apply;

355

otherwise, they do not. These terms define conformance to *this document (and [RFC2911]) only*; they do not affect

356

conformance to other documents, unless explicitly stated otherwise. To be more specific:

357

REQUIRED - an adjective used to indicate that a conforming IPP Printer implementation **MUST** support the indicated

358

operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. See

359

[RFC2911] "Appendix A - Terminology for a definition of "support". *Since support of this entire Document Object*

360

specification is OPTIONAL for conformance to IPP/1.1, the use of the term REQUIRED in this document means

361

"REQUIRED if this OPTIONAL Document Object specification is implemented".

362

RECOMMENDED - an adjective used to indicate that a conforming IPP Printer implementation is recommended to

363

support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and

364

responses. *Since support of this entire Document Object specification is OPTIONAL for conformance to IPP/1.1, the*

365

use of the term RECOMMENDED in this document means "RECOMMENDED if this OPTIONAL Document Object

366

specification is implemented".

³ The Create-Document operation maps to the PWG PSI Send-Document-By-Post operation and the Send-Data maps to the HTTP Post operation.

367 **OPTIONAL** - an adjective used to indicate that a conforming IPP Printer implementation MAY, but is NOT
368 REQUIRED to, support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in
369 requests and responses.

370 2.2 Other Terminology

371 This document uses the same terminology as [RFC2911], such as “**client**”, “**Printer**”, “**attribute**”, “**attribute value**”,
372 “**keyword**”, “**Job Template attribute**”, “**Operation attribute**”, “**operation**”, “**request**”, “**response**”, and “**support**”
373 with the same meaning. In addition, the following terms are defined for use in this document:

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

376 **Job Creation operation** - operations that create Job objects, specifically: Print-Job, Print-URI, and Create-Job as
377 defined in [RFC2911].

378 **Document Creation operation** - operations that create Document objects. Specifically: Create-Document, Print-
379 Job, Print-URI, Send-Document and Send-URI. Note: the Print-Job and Print-URI are both **Job Creation** and
380 **Document Creation** operations, since they create both Job and a **Document object** at the same time. Also this
381 specification does not extend the Print-Job and Print-URI operations. However, this specification does extend the
382 Send-Document and Send-URI operations to allow the client to supply **Document Template** attributes in each
383 request.

384 **Job Level** - attributes supplied in the Print-Job, Print-URI, and Create-Job are referred to as being supplied at the
385 **Job Level**. Attributes supplied at the **Job Level** are a mixture of **Job attributes** and **Document attributes**. **Job**
386 **attributes** apply to the Job as a whole, while **Document attributes** provide defaults for the **Document objects** in
387 case the client does not supply a **Document attribute** at the **Document Level** for a **Document object**. Put another
388 way, **Document objects** *inherit* **Document attributes** from the **Job object** which are used if the client didn't supply
389 a corresponding attribute for the **Document object**.

390 **Document Level** - attribute supplied in the Send-Document, Send-URI, and Create-Document operations are
391 referred to as being supplied at the **Document Level**. Note: attribute supplied in the Print-Job and Print-URI
392 requests are considered as being supplied at the **Job Level** only, *not* also at the **Document Level**, even though
393 Print-Job and Print-URI also create **Document objects**.

394 **Attribute Precedence** - the precedence rules which dictate which attribute value takes precedence when the same
395 attribute is supplied at different points in the work flow with different values, such as at both the **Job Level** and the
396 **Document Level**. See section 5.

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

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

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

404 Table 2 shows this terminology as applied to the six operations. Note that Print-Job and Print-URI are both Job
405 Creation operations and Document Creation operations, though they only create single Document jobs. In other
406 words, for Print-Job and Print-URI, there is only one document per job, so whether the attributes are considered to be
407 submitted at the Job Level and then inherited by the Document object, is moot, since these operations do not have a

408 separate Document group in which the client can supply Document attributes. Note also that for the “Level” concept,
409 no operation supplies attributes at more than one level.⁴

410 **Table 2 - Job Creation and Document Creation operations**

Job Creation operation	Document Creation operation	Operation	Attribute Group in Request		Level
			Job	Document	
yes		Create-Job	Job attributes and Document attributes		Job Level
yes	yes	Print-Job	Job attributes and Document attributes		
yes	yes	Print-URI	Job attributes and Document attributes		
	yes	Create-Document		Document attributes	Document Level
	yes	Send-Document		Document attributes	
	yes	Send-URI		Document attributes	

411

412 **Document Overrides** - a way for a client to specify attributes to apply to specified documents in a multi-document
413 job. Specifically, as member attributes of the “document-overrides” **Job Template attribute** in a **Job Creation**
414 operation or the “document-overrides” **operation attribute** in a **Document Creation operation** as defined in
415 [override]. Note: The **Document Template attributes** supplied in a Create-Document, Send-Document, or Send-
416 URI operation also “override” any Document Template attributes supplied in the Job Creation operation.

417 3 Document Operations

418 The Document object semantics are as parallel to the Job object semantics as possible. Therefore, most of the Job
419 operations have analogous Document operations as shown in Table 15 in section “Appendix A: Document operations
420 compared to Job operations”. Operations that can apply only to an entire job, have no analogous document
421 operation as indicated. This extension adds 8 new Document operations that operate on the Document object once
422 it is created by the new Create-Document operation or either of the existing two operations: Send-Document and
423 Send-URI operations.

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

426 The signatures of the operation requests that create and/or validate Document objects are very similar as shown in
427 Table 3 and defined in section 3.1 through section 1.1. The entries in the table show what a client MUST, MAY, or
428 MUST NOT supply in the indicated operation requests.

⁴ The PWG Semantic Model [pwg-sm] calls the Operation attributes supplied by the client: Job Description attributes or Document Description attributes for the Job Creation and Document Creation operations, respectively. The [pwg-sm] also calls Job Template attributes and Document Template attributes: Job Processing and Document Processing attributes, respectively. Each Processing attribute is defined to be a Job Processing or a Document Processing attribute, but is not both. The client can supply both Job Processing and Document Processing attributes in a Job Creation operation, in which case the Document Processing attributes server as defaults for the Document objects. The Printer copies all of these client’s supplied attributes to the Job or Document object. Read-only Job and Document attributes that the system sets are called Job State and Document State attributes (instead of Description attributes).

429

Table 3 - Client-supplied Document Creation and Validation Request Signatures

	Create-Document	Send-Data	Send-Document	Send-URI	Validate-Document
Target job	MUST	MUST	MUST	MUST	MAY
"input-document-number"	MAY	MUST	MAY	MAY	MAY
"document-uri"	MUST NOT	MUST NOT	MUST NOT	MUST	MAY
Document Template attributes	MAY	MUST NOT	MAY	MAY	MAY
Data	MUST NOT	MUST	MUST	MUST NOT	MUST NOT

430

431 The entries in Table 4 show what a Printer MUST, MAY, or MUST not support and return in the indicated operations
 432 responses.

433

Table 4 - Printer-returned Document Creation and Validation Response Signatures

	Create-Document	Send-Data	Send-Document	Send-URI	Validate-Document
Status code/message	MUST	MUST	MUST	MUST	MUST
Unsupported Attributes	MUST, if any	MUST, if any	MUST, if any	MUST, if any	MUST, if any
Job status attributes	MUST	MUST	MUST	MUST	MUST NOT
Document status attributes:					
"document-number"	MUST	MUST	MUST	MUST	MUST NOT
"document-id-uri"	MUST	MUST	MUST	MUST	MUST NOT
"document-state"	MUST	MUST	MUST	MUST	MUST NOT
"document-state-reasons"	MUST	MUST	MUST	MUST	MUST NOT
"document-state-message"	MAY	MAY	MAY	MAY	MUST NOT

434

435 **3.1 Create-Document Operation**

436 This REQUIRED operation allows a client to create a Document object, supply Document attributes, and have the
 437 Printer validate those attributes without sending any document content data. If the Printer rejects the request, the
 438 client won't have sent the possibly time-consuming data. The client MUST perform the operations in the following
 439 order: (1) Create-Job to create the Job object, (2) Create-Document to create the Document object, (3) Send-Data
 440 (see section 3.2) to send the content data for the Document object.

441 The client can supply multiple documents for a single Job using pairs of Create-Document and Send-Data
 442 operations. The order of the corresponding Send-Data operations is not important, so that the client can send pairs
 443 of Create-Document and Send-Data operations or can send a number of Create-Document operations followed by
 444 the corresponding Send-Data operations. The latter approach is useful if the client wants to make sure that all
 445 Documents will be accepted by the Printer before sending any of the Document data to the Printer.

446 If a Printer supports the Document object, the Printer:

- 447 1. MUST also support the Create-Document and Send-Data operations
- 448 2. MUST support the "multiple-operation-time-out" Printer Description attribute (see [RFC2911] section 4.4.31).

- 449 3. MUST support the "multiple-document-jobs-supported" Printer Description attribute (see [RFC2911] section
450 4.4.16) with a 'true' value, that is the Printer MUST support multiple document jobs.
- 451 4. MUST support the "multiple-document-handling" Job Template job attribute with at least one value (see
452 [RFC2911] section 4.2.4) and the associated "multiple-document-handling-default" and "multiple-document-
453 handling-supported" Job Template Printer attributes (see [RFC2911] section 4.2).
- 454 5. MUST support the Attribute Precedence semantics specified in section 5 for the levels that the Printer
455 supports.

456 The Printer sets the value of the Document's "document-state" Document Description attribute to 'pending', if the
457 Printer accepts the Create-Document request. A Printer MAY set the 'job-data-insufficient' value of the Document's
458 "document-state-reason" Document Description attribute to indicate that processing cannot begin until sufficient data
459 has arrived and set the "document-state" to 'pending'. A non-spooling printer that doesn't implement the 'pending'
460 document state may even set the "document-state" to 'processing', even though there is not yet any data to process.
461 See sections 8.2.16 and 8.2.18.

462 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
463 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see
464 [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden',
465 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

466 3.1.1 Create-Document Request

467 The client supplies the following groups as part of the Create-Document Request:

468 Group 1: Operation Attributes

469 **Natural Language and Character Set:**

470 First, the client MUST supply the "attributes-charset" and "attributes-natural-language" Operation attributes
471 as described in [RFC2911] section 3.1.4.1. The Printer object MUST copy these values to the corresponding
472 Job Description attributes described in [RFC2911] sections 4.3.19 and 4.3.20.

473 **Target:**

474 Next, the client MUST supply either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri"
475 (uri) operation attribute(s) which define the target Job object for this operation as described in [RFC2911]
476 section 3.1.5. The client MAY supply the remaining Operation attributes in any order following:

477 **Requesting User Name:**

478 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
479 [RFC2911] section 8.3.

480 **3.1.1.1ipp-attribute-fidelity (boolean) (RFC2911) sections 3.2.1 and 15)**

481 ~~This operation attribute is defined in [RFC2911] to indicate whether or not the Printer MUST honor all
482 supplied Job Template attributes in the Job Creation request. In this Document Creation request, this
483 attribute applies to the supplied Document Template attributes. All Printer implementations MUST support
484 this attribute with the 'true' and 'false' values. See [RFC2911] section 15 for a full description of "ipp-
485 attribute-fidelity" and its relationship to other attributes, especially the Printer object's "pdl-override-
486 supported" attribute.~~

487 **3.1.1.2 document-mandatory-attributes (1setOf type2 keyword)**

488 This operation attribute identifies which Document Template attributes the Printer MUST honor in a
 489 Document Creation request. The Printer MUST reject the operation, if the client supplies an unsupported
 490 Document Template attribute in the request that is also identified in this list or the supplies an unsupported
 491 value of such an identified attribute. The client MAY supply this attribute in Document Creation operations.
 492 The Printer MUST support this attribute in Document Creation operations with any values. The Printer
 493 MUST copy this attribute to the corresponding "document-mandatory-attributes" Document Description
 494 attribute (see section 8.2.12) for auditing and trouble-shooting purposes, even though this attribute MUST
 495 NOT have any effect beyond the acceptance or rejection of this Job Creation request.

496 The Printer MUST ignore this attribute if the client supplies the "ipp-attribute-fidelity" operation attribute (see
 497 section 3.1.1.1) with a 'true' value, since a 'true' value indicates that the Printer MUST honor all supplied Job
 498 Template attributes and Document Template attributes.

499 The values of the "document-mandatory-attributes" attribute are the keyword attribute names that identify
 500 Document Template attributes, for example, 'copies' and 'media'. In order to identify a member attribute of a
 501 collection attribute, the keyword names of both the collection attribute and the member attribute are given
 502 separated by a period (.) character. For example, to make the "media" attribute of the "cover-front" collection
 503 attribute mandatory, supply the keyword value: 'cover-front.media'.

504 The behavior of this Document Creation operation is not affected by the "job-mandatory-attributes" operation
 505 attribute (see section 4.3.1) supplied with the Job Creation operation, if any. In other words, there is no
 506 inheritance of must honor attributes from the Job level to the Document level (see section 3.1.1.6).

507 Note: the reason that there are two operation attributes with different names is so that it is clear that the "job-
 508 mandatory-attributes" operation attribute is *not* inherited by subsequent Document Creation operations for
 509 the same job (since other operation attributes inherit the values from the Job Creation operation for those
 510 operation attributes that are defined for both Job Creation and Document Creation operations).

511 **3.1.1.3.1.1 input-document-number (integer(1:MAX)) DEPRECATED operation attribute**

512 The "input-document-number" operation attribute ([override] section 9.2.1) is DEPRECATED. A client MUST
 513 NOT supply the "input-document-number" operation attribute. Clients that want to submit multiple (large)
 514 document data in parallel MUST create each Document object separately in the order desired. Then the
 515 client MAY send the data in parallel with separate Send-Document operations (see section 3.2). If the client
 516 does supply the DEPRECATED "input-document-number" operation attribute, the Printer MUST ignore the
 517 value and assign the "document-number" Document Description attribute monotonically increasing starting
 518 with 1 for each job (see below). The client MAY supply the "input-document-number" Operation attribute to
 519 indicate which Document object in the Job to which this Create-Document request is to apply. If the Printer
 520 supports this attribute, the Printer MUST also support the corresponding "document-number" (text(127))
 521 Document Description attribute (see section 8.5) and copy this value to the "document-number" Document
 522 Description attribute. Usually the client omits this Operation attribute, so that the Printer assigns the next
 523 integer value starting at 1 for each Job. A client that is creating multiple Document objects in parallel MAY
 524 wish to supply this attribute in order to control the order of the Documents in the job. If supplied, the Printer
 525 MUST copy the value to the Document object's "document-number" Document Description attribute. If the
 526 Job already contains a Document with the same "document-number" value as the one supplied by this
 527 attribute, the Printer MUST reject the request and return the "client-error-client-error-conflicting-attributes"
 528 (see [RFC2911] section 13.1.4.15) and the "input-document-number" and "document-number" attributes.

529 **3.1.1.4.3.1.2 last-document (boolean) operation attribute**

530 The client MUST supply this attribute (as in the Send-Document and Send-URI operation requests). The
 531 Printer object MUST support this attribute. This attribute is a boolean flag that the client supplies with a 'true'
 532 value if this is the last document for the Job, 'false' otherwise.

533 [3.1.1.5](#)[3.1.1.3](#) document-message (text(427MAX)) operation attribute

534 The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
 535 support the corresponding "document-message" (text(427MAX)) Document Description attribute (see section
 536 8.2.12) and copy this value to the "document-message" Document Description attribute. The end user can
 537 use this Document Description attribute as a message to the operator and the operator can use it as a
 538 message to the user. The Printer MAY print this message on a document start sheet for this document, if
 539 any.

540 3.1.1.4 Additional Operation attributes:

541 Any of the other Operation attributes indicated in the "Level Supplied" column labeled with a "y" in the "Doc"
 542 column in Table 6, such as "document-name" and "document-format". These operation attributes are said to
 543 be supplied at the Document Level and apply to the Document object, overriding any operation attributes
 544 supplied at the Job Level. For example, if "document-format" = 'application/postscript' at the Job Level and
 545 "document-format" = 'text/plain' in this Create-Document request, this Document will be 'text/plain'. If the
 546 next Create-Document request for this Job omits the "document-format" operation attribute, that Document
 547 will be 'application/postscript'.

548 3.1.1.5 Ignoring unsupported or improper operation attributes:

549 The Printer MUST ignore any operation attributes which are unsupported or are not defined for use with the
 550 Create-Document operation, such as "ipp-attribute-fidelity" (see section 4.3.1) and "job-mandatory-attributes"
 551 (see section 4.3.2) which are defined for use in Job Creation operations only.

552 Group 2: Document Template Attributes

553 Any Document Template attributes in any order:

554 The client OPTIONALLY supplies a set of Document Template attributes, that is any attributes indicated in
 555 Table 8 in the "Defined for use" column labeled with a "y" in the "D" column. These Document Template
 556 attributes are said to be supplied at the Document Level and apply to the Document object, overriding any
 557 Document Template attributes supplied at the Job Level. For example, if "media" = 'na-letter-white' at the
 558 Job Level and "media" = 'na-letter-transparency' in this Create-Document request, this Document will be 'na-
 559 letter-transparency'. If the next Create-Document operation for this Job omits the "media" operation attribute,
 560 that Document will be 'na-letter-white' which it inherits from the Job.

561 If the client is not supplying any Document Template attributes in the request, the client SHOULD omit Group
 562 2 rather than sending an empty group. However, a Printer object MUST be able to accept an empty group.

563 The client MUST NOT supply the document data in this operation request. See Send-Data operation
 564 (section 3.2).

565 Group 3: Subscription Attributes (see [ntfy] section 11.1.3.1): MUST NOT be present. Notification is only at 566 the Job Level.

567 In addition to the MANDATORY parameters required for every operation request (see [RFC2911]), the simplest
 568 Create-Document request consists of just the "attributes-charset" and "attributes-natural-language" operation
 569 attributes; either (1) the "printer-uri" target operation attribute and the "job-id" or (2) the "job-uri" and nothing else. In
 570 this simple case, the Printer object:

571 - creates a new Document object and adds it to the specified Job object,

572 - assigns the lowest document number not yet used by this Job, starting a 1, if the client did not supply an
 573 "input-document-number" operation attribute (see section 3.1.1.1). Copy the document number assigned
 574 or supplied to the Document object's "document-number" Document Description attribute.

- 575 - stores a generated Document name in the "document-name" Document Description attribute in the natural
576 language and charset requested (see [RFC2911] section 3.1.4.1) (if those are supported, otherwise using
577 the Printer object's default natural language and charset), and
- 578 - at job processing time, uses its corresponding default value attributes for the supported Document Template
579 attributes that were (1) not supplied by the client as IPP attributes and (2) not embedded instructions in the
580 document data.

581 3.1.2 Create-Document Response

582 The Printer object MUST return the following sets of attributes to the client as part of the Create-DocumentJob
583 response:

584 Group 1: Operation Attributes

585 Status Message:

586 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
587 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
588 in [RFC2911] sections 13 and 3.1.6.

589 The Printer MUST reject the operation if the client had supplied in the original Job Creation operation, either:

590 if the client supplies the "ipp-attribute-fidelity" operation attribute (see section 4.3.1) with a 'true'
591 value and the client supplies any unsupported and/or conflicting Job Template or Document
592 Template attributes in this Document Creation request OR-

593 if the client omits or supplies the "ipp-attribute-fidelity" operation attribute (section 4.3.1) with a 'false'
594 value or had omitted it and had supplieds keyword values of the "document-job-mandatory-
595 attributes" operation attribute (in the original Job Creation operation) that identify attributes supplied
596 in this request that are unsupported and/or conflicting.

597 Otherwise, the Printer MUST accept the operation and ignore or substitute unsupported and/or conflicting
598 attribute values supplied by the client. See the Implementer's Guide [RFC3196] for a complete description of
599 the suggested steps for processing the attributes in a create request.

600 Natural Language and Character Set:

601 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
602 3.1.4.2.

603 Group 2: Unsupported Attributes

604 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

605 The value of the "ipp-attribute-fidelity" and the "document-job-mandatory-attributes" operation attributes
606 supplied by the client in the original Job Creation request does not affect what attributes the Printer object
607 returns in this group. The value of these two operation attributes in the original Job Creation request only
608 affects whether the Create-DocumentJob operation is accepted or rejected. If the Document request is
609 accepted, the client may query the Document object using the Get-Document-Attributes operation (see
610 section 1.1) requesting the unsupported attributes that were returned in the create response to see which
611 attributes were ignored (not stored on the Document object) and which attributes were stored with other
612 (substituted) values.

613 Group 3: Job Object Attributes

614 In addition, the Printer MUST return the same Job status attributes that [RFC2911] REQUIRES for the Send-
615 Document and Send-URI operation responses (which are the same as for the Print-Job response -
616 [RFC2911] section 3.2.1.2):

617 "job-uri" (uri) - see [RFC2911] section 4.3.1
618 "job-id" (integer(1:MAX)) - see [RFC2911] section 4.3.2
619 "job-state" (type1 enum) - see [RFC2911] section 4.3.7
620 "job-state-reasons" (1setOf type2 keyword) - see [RFC2911] section 4.3.8

621
622 The Printer MAY return:

623 "job-state-message" (text(MAX)) - see [RFC2911] section 4.3.9
624 "number-of-intervening-jobs" (integer(0:MAX)) - see [RFC2911] section 4.3.15

626 Group 4: Document Object Attributes

627 3.1.2.1 document-number (integer(1:MAX)) [Document Description attribute](#)

628 The Printer MUST return the document number of this Document object that was either assigned by the
629 Printer (see section 3.1.1) or supplied by the client (see section 3.1.1.1).

630 3.1.2.2 document-id-uri (uri) [Document Description attribute](#)

631 The Printer MUST return the document id of this Document object as a URI as assigned by the Printer (see
632 section 8.2.11).

633 3.1.2.3 document-state (type1 enum) [Document Description attribute](#)

634 The Printer MUST return the state of this Document object (see section 8.2.16).

635 3.1.2.4 document-state-reasons (1setOf type2 keyword) [Document Description attribute](#)

636 The Printer MUST return the associated state reasons for this Document (see section 8.2.18).

637 3.1.2.5 document-state-message (text(MAX)) [Document Description attribute](#)

638 The Printer MAY return the localized description of the "document-state" and "document-state-reasons"
639 values for this Document (see section 8.2.17).

640 3.2 Send-Data Operation

641 This REQUIRED operation allows the client to create a Document object using the Create-Document operation (see
642 section 3.1) that the Printer validates before the client sends any document content data. Then the client can skip
643 sending the data to the Printer, if the Printer rejects the Document Creation operation.

644 Since the Create-Document and the Send-Data operation that follows could occur over an arbitrarily long period of
645 time for a particular Document, a client MUST send the Send-Data operation within an IPP Printer defined minimum
646 time interval after the receipt of the previous request for the job. If a Printer object supports the Document object, the
647 Printer object MUST support the "multiple-operation-time-out" attribute (see [RFC2911] section 4.4.31). This
648 attribute indicates the minimum number of seconds the Printer object will wait for the next send operation before
649 taking some recovery action. See the description under Send-Document in [RFC2911] section 3.3.1, for the possible
650 Printer actions, if the client does not supply a Send-Data request in time.

651 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
652 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see
653 [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden',
654 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

655 3.2.1 Send-Data request

656 The following attribute sets are part of the Send-Data Request:

657 Group 1: Operation Attributes

658 **Natural Language and Character Set:**

659 The "attributes-charset" and "attributes-natural-language" attributes as described in section [RFC2911]
660 3.1.4.1.

661 **Target:**

662 The "document-number" (integer(1:MAX)) operation attribute MUST be supplied immediately after either (1)
663 the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) and "operation attribute(s) which
664 define the target Document object for this operation as described in section [RFC2911] 3.1.5. If the client
665 omits the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-
666 error-bad-request' status code.

667 **Requesting User Name:**

668 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
669 [RFC2911] section 8.3.

670 Group 2: Document Content

671 The client MUST supply the document data in-line to be processed for this Document, just like supplying
672 data in the Send-Document and Print-Job requests.

673 3.2.2 Send-Data Response

674 The following sets of attributes are part of the Send-Data Response:

675 Group 1: Operation Attributes

676 **Status Message:**

677 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
678 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
679 in [RFC2911] sections 13 and 3.1.6.

680 **Natural Language and Character Set:**

681 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
682 3.1.4.2.

683 Group 2: Unsupported Attributes

684 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

685 Group 3: Job Object Attributes

686 The Printer MUST return the same set of Job status attributes as for the Print-Job, Send-Document, and
687 Create-Document responses (see section 3.1.2).

688 Group 4: Document Object Attributes

689 The Printer MUST return the same set of Document status attributes as for the Create-Document operation
690 response (see section 3.1.2)

691 ~~ISSUE 01: OK for the Send-Data operation to return Document status attributes (as well as Job status~~
692 ~~attributes) so as to be like the other Document operations? Yes - New Orleans~~

693 3.3 Send-Document Operation

694 This REQUIRED⁵ operation allows a client to submit multiple documents in a single Job by making a Send-Document
695 request for each Document. In this specification, the Send-Document creates a Document object ([RFC2911] did not
696 have a Document object). A Printer MUST support this operation with the semantics specified in [RFC2911] and with
697 the extension defined in this specification, since this specification REQUIRES the Printer to support multiple
698 document jobs.

699 See [RFC2911] section 3.3.1 for the semantics of the Send-Document operation not reproduced here.

700 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
701 owner (as determined in the Create-Job operation) or an operator or administrator of the Printer object (see
702 [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the operation and return: 'client-error-forbidden',
703 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

704 3.3.1 Send-Document Request

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

706 Group 1: Operation Attributes (as in [RFC2911])

707 As specified in [RFC2911] section 3.3.1 Send-Document request, plus any extensions indicated in Table 6.
708 For example, "compression", "document-format", and "document-name". So this group is the same as for
709 Create-Document (see section 3.1.1).

710 Group 2: Document Attributes (new - not in [RFC2911])

711 The client OPTIONALLY supplies a set of Document Template attributes as listed in Table 8. For example,
712 "media" and "number-up". If the client is not supplying any Document Template attributes in the request, the
713 client SHOULD omit Group 2 rather than sending an empty group. However, a Printer object MUST be able
714 to accept an empty group.

715 Group 3: Document Content (as in [RFC2911] Group 2)

716 The client MUST supply the document data in-line to be processed for this Document if the "last-document"
717 flag is set to 'false'. However, since a client might not know that the previous Document object created with a
718 Create-Job, Send-Document, or Send-URI operation was the last document (i.e., the "last-document"
719 attribute was set to 'false'), it is legal to send a Send-Document request with no document data where the
720 "last-document" flag is set to 'true'. For this case, the Printer MUST NOT increment the value of the Job
721 object's "number-of-documents" attribute, since no Document object was added to the job. In addition, it is
722 not an error for a client to submit a job with no actual document data, i.e., only a single Create-Job and

⁵ The Send-Document operation is REQUIRED in this specification while it was OPTIONAL in [RFC2911]. This difference is because this specification REQUIRES Printer support of multiple document jobs, while [RFC2911] did not.

723 Send-Document request with a "last-document" operation attribute set to 'true' with no document data; it is
724 only an empty job which is scheduled and processed normally.

725 3.3.2 Send-Document Response

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

727 Group 1: Operation Attributes (as in [RFC2911] Group 1)

728 Status Message:

729 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
730 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
731 in [RFC2911] sections 13 and 3.1.6.

732 Natural Language and Character Set:

733 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
734 3.1.4.2.

735 Group 2: Unsupported Attributes (as in [RFC2911] Group 2)

736 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

737 Group 3: Job Object Attributes (as in [RFC2911] Group 3)

738 The Printer MUST return the same set of Job status attributes as for the Print-Job, Send-Document, and
739 Create-Document responses (see section 3.1.2).

740 Group 4: Document Object Attributes (new - as in Create-Document Group 3 - see section 3.1.2)

741 The Printer MUST return the same set of Document status attributes as for the Create-Document operation
742 response (see section 3.1.2).

743 3.4 Send-URI Operation

744 This OPTIONAL operation has the same request and response semantics as the Send-Document operation (see
745 section 3.3) except that a client MUST supply a URI reference ("document-uri" operation attribute) rather than the
746 document data itself. If a Printer object supports this operation, clients can use both Send-URI or Send-Document
747 operations to add new documents to an existing multi-document Job object. However, if a client needs to indicate
748 that the previous Send-URI or Send-Document was the last document, the client MUST use the Send-Document
749 operation with no document data and the "last-document" flag set to 'true' (rather than using a Send-URI operation
750 with no "document-uri" operation attribute).

751 If a Printer object supports this operation, it MUST also support the Print-URI operation (see [RFC2911] section
752 3.2.2).

753 The Printer object MUST validate the syntax and URI scheme of the supplied URI before returning a response, just
754 as in the Print-URI operation. The IPP Printer MAY validate the accessibility of the document as part of the operation
755 or subsequently (see [RFC2911] section 3.2.2).

756 ~~3.5 Validate Document Operation~~

757 ~~This REQUIRED operation allows the client to verify capabilities of a Printer against whatever attributes the client~~
758 ~~supplies in the Validate Document request in combination with the previously submitted partial Job, if any. This~~
759 ~~operation has the same inputs as the Create Document operation request (section 3.1) except the Printer does not~~
760 ~~create a new Document object. The Printer object returns the same status codes, Operation Attributes (Group 1)~~
761 ~~and Unsupported Attributes (Group 2) as the Create Document operation (see section 3.1.2). However, no Job~~
762 ~~Object Attributes (Group 3) and no Document Object Attributes (Group 4) are returned, since no Document object is~~
763 ~~created.~~

764 ~~The client MAY supply a Job object Target, that MUST be either (1) a "printer-uri" and a "job-id" operation attribute or~~
765 ~~(2) a "job-uri" operation attribute. If supplied, the Job Target MUST identify a job that has been created by Create-~~
766 ~~Job ([RFC2911] section 3.2.4), but not yet closed, that is, the client hasn't yet supplied the "last-document" operation~~
767 ~~attribute with a 'true' value. When the client supplies the Job object Target, the Printer MUST validate that an~~
768 ~~identical Create Document, Send Document, or Send-URI operation would have been accepted in the context of the~~
769 ~~specified Job and its other Document objects.~~

770 ~~If the client omits the Job Target by including only the "printer-uri" operation attribute, the Printer performs the same~~
771 ~~validation as for a Create Document in which there were no Job attributes supplied in the Create Job and no other~~
772 ~~Documents. The Printer MUST support the Validate Document operation with and without the Job object Target~~
773 ~~being present.~~

774 ~~In addition to the attributes and groups defined for a Create Document request (see section 3.1.1), the client MAY~~
775 ~~supply the "document-uri" operation attribute (defined in the Send-URI operation in [RFC2911] section 3.3.2). If the~~
776 ~~client supplies the "document-uri" operation attribute, the Printer MUST validate that the URI scheme is supported~~
777 ~~and that the referenced data is accessible.~~

778 ~~If the client discovers that a Validate Document operation fails, it has the choice of (1) canceling the entire partially~~
779 ~~created job, if any, (2) closing the partially created Job as is (with a Send Document supplying the "last-document"~~
780 ~~with a 'true' value) so that the Printer will process the Job, or (3) adding other Document objects (with Create-~~
781 ~~Document, Send Document, and/or Send-URI) and then closing the Job.~~

782 ~~By using the Validate Document operation a client can validate that an identical Create Document operation (or a~~
783 ~~Send Document operation with the document data or a Send-URI operation) would be accepted by the Printer in the~~
784 ~~context of the partially submitted Job. The Validate Document operation also performs the same security negotiation~~
785 ~~as the Create Document operation (see [RFC2911] section 8), so that a client can check that the client and Printer~~
786 ~~object security requirements can be met before performing a Create Document, Send Document, or Send-URI~~
787 ~~operation.~~

788 **3.5 Get-Document-Attributes Operation**

789 This REQUIRED operation allows a client to request the values of selected attributes of a Document object. This
790 operation is almost identical to the Get-Job-Attributes operation (see [RFC2911] section 3.3.4). The only differences
791 are that the operation is directed at a Document object rather than a Job object and the returned attribute group is a
792 set of Document object attributes rather than a set of Job object attributes.

793 The Printer MUST return the attributes that a client supplied in the Create-Document, Send-Document, or Send-URI
794 operations, plus any Document Description attributes that the Printer has generated. The Printer MUST NOT return
795 any Job Level attributes that the Document object inherits, including "document-overrides" (1setOf collection)
796 member attributes (see [override]), and MUST NOT factor out common Document object attributes and return them
797 as Job object attributes. Thus the Get-Document-Attributes returns to clients the attributes that clients submitted with
798 the Job object and with the Document object.

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

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

807 - 'document-template': the subset of the Document Template attributes that apply to a Document object (the "D"
808 column in Table 8) that the implementation supports for Document objects.

809 - 'document-description': the subset of the Document Description attributes specified in the "Doc" column of
810 Table 9 that the implementation supports for Document objects.

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

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

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

819 3.5.1 Get-Document-Attributes Request

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

822 Group 1: Operation Attributes

823 Natural Language and Character Set:

824 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
825 3.1.4.1.

826 Target:

827 The "document-number" (integer(1:MAX)) operation attribute MUST be supplied immediately after either (1)
828 the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which define
829 the target Document object for this operation as described in [RFC2911] section 3.1.5. If the client omits the
830 "document-number" operation attribute, the Printer MUST reject the request and return the 'client-error-bad-
831 request' status code.

832 Requesting User Name:

833 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
834 [RFC2911] section 8.3.

835 3.5.1.1 "requested-attributes" (1setOf keyword):

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

839 3.5.2 Get-Document-Attributes Response

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

841 Group 1: Operation Attributes

842 Status Message:

843 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
844 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
845 in [RFC2911] sections 13 and 3.1.6.

846 Natural Language and Character Set:

847 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
848 3.1.4.2. The "attributes-natural-language" MAY be the natural language of the Document object, rather than
849 the one requested.

850 Group 2: Unsupported Attributes

851 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

852 The response NEED NOT contain the "requested-attributes" operation attribute with any supplied values
853 (attribute keywords) that were requested by the client but are not supported by the Printer. If the Printer
854 object does return unsupported attributes referenced in the "requested-attributes" operation attribute and that
855 attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes
856 described in the standard but not supported by the implementation.

857 Group 3: Document Object Attributes

858 This is the set of requested attributes and their current values. The Printer ignores (does not respond with)
859 any requested attribute or value which is not supported. Furthermore, the Printer MUST NOT return
860 Document Template attributes that were not supplied by a client in a Create-Document, Send-Document, or
861 Send-URI request or set by a Set-Document-Attributes request. So the response reflects what was
862 submitted. The Printer MAY omit returning attributes that are restricted by the Printer's security policy in
863 force, including whether the requesting user is the user that submitted the job (job originating user) or not
864 (see [RFC2911] section 8). However, the Printer MUST respond with the 'unknown' value for any supported
865 attribute (including all REQUIRED attributes) for which the Printer does not know the value, unless it would
866 violate the security policy. See the description of the "out-of-band" values in the beginning of [RFC2911]
867 Section 4.1.

868 3.6 Get-Documents Operation

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

872 This operation is similar to the Get-Document-Attributes operation (see section 1.1), except that this Get-Documents
873 operation returns attributes from all Document objects contained in the Job object, instead of from a single selected
874 Document object in the Job object. As with the Get-Document-Attributes operation the Printer MUST only return
875 attributes that were submitted by a client when the Document object was created by the Create-Document, Send-
876 Document, or Send-URI operations and possibly modified by the Set-Document-Attributes operation (see section
877 3.7).

878 3.6.1 Get-Documents Request

879 The client submits the Get-Documents request to a Printer object. The Get-Documents is similar to the Get-Jobs
880 operations (see [RFC2911] section 3.2.6) except that there are no equivalents to the "which-jobs" and "my-jobs"
881 operation attributes.

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

883 Group 1: Operation Attributes

884 Natural Language and Character Set:

885 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
886 3.1.4.1.

887 Target:

888 Either (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s)
889 which define the target Job object for this operation as described in [RFC2911] section 3.1.5.

890 Requesting User Name:

891 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
892 [RFC2911] section 8.3.

893 3.6.1.1 "limit" (integer(1:MAX)):

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

900 3.6.1.2 "requested-attributes" (1setOf type2 keyword):

901 The client OPTIONALLY supplies this attribute. The Printer object MUST support this attribute. It is a set of
902 Document attribute names and/or attribute groups names in whose values the requester is interested. This
903 set of attributes is returned for each Document object that is returned. The allowed attribute group names
904 are the same as those defined in the Get-Documents-Attributes operation in section 3.5.1.

905 If the client does not supply this attribute, the Printer MUST respond as if the client had supplied this attribute
906 with the two values:

907 'document-number' (see section 8.2.15)

908 'document-id-uri' (see section 8.2.11).

909

910 3.6.2 Get-Documents Response

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

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

916 Group 1: Operation Attributes

917 Status Message:

918 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
919 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
920 in [RFC2911] sections 13 and 3.1.6.

921 Natural Language and Character Set:

922 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
923 3.1.4.2.

924 Group 2: Unsupported Attributes

925 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

926 The response NEED NOT contain the "requested-attributes" operation attribute with any supplied values
927 (attribute keywords) that were requested by the client but are not supported by the Printer. If the Printer
928 object does return unsupported attributes referenced in the "requested-attributes" operation attribute and that
929 attribute included group names, such as 'all', the unsupported attributes MUST NOT include attributes
930 described in the standard but not supported by the implementation.

931 Groups 3 to N: Document Object Attributes

932 The Printer object responds with one set of Document Object Attributes for each returned Document object.
933 The Printer object ignores (does not respond with) any requested attribute or value which is not supported or
934 which is restricted by the security policy in force, including whether the requesting user is the user that
935 submitted the job (job originating user) or not (see [RFC2911] section 8). However, the Printer object MUST
936 respond with the 'unknown' value for any supported attribute (including all REQUIRED attributes) for which
937 the Printer object does not know the value, unless it would violate the security policy. See the description of
938 the "out-of-band" values in the beginning of [RFC2911] section 4.1.

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

941 3.7 Set-Document-Attributes Operation

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

946 This operation is almost identical to the Set-Job-Attributes operation and follows the same rules for validation (see
947 [set-ops] section 4.2). The only differences are that the Set-Document-Attributes operation is directed at a Document
948 object rather than a Job object. As with the Set-Job-Attributes operation, The Set-Document-Attributes operation
949 can add an attribute to the Target object, accepts the 'delete-attributes' out-of-band value to remove an attribute from
950 the Target object. In addition the validation is the same as the Create-Documents, Send-Document, and Send-URI
951 operations that create Document objects, i.e., the Printer validation depends on the "xxx-supported" Printer
952 Description attributes (see [RFC2911] section 3.1).

953 If a client supplies a document attribute in a Set-Document-Attributes request that the Printer supports, and the
954 document was originally submitted without supplying that attribute, the Printer adds the attribute to the Document
955 object.

956 If the client supplies a document attribute with the "out-of-band" value 'delete-attribute' (see [set-ops] section 8.2),
 957 then the Printer MUST remove the attribute and all of its values from the Document object, if present. The semantic
 958 effect of the client supplying the 'delete-attribute' value in a Set-Document-Attributes operation MUST be the same as
 959 if the attribute had not been supplied with the Document object in the Document Creation operation, i.e., the Printer
 960 applies its default attribute or behavior with lower precedence than the PDL (see the beginning of [RFC2911] section
 961 4.2 and [RFC2911] 3.2.1.1). Any subsequent query of the Document object using Get-Document-Attributes or Get-
 962 Documents MUST NOT return any attribute that has been deleted using the 'delete-attribute' out-of-band value.
 963 However, a client can re-establish such a deleted Document attribute with any supported value(s) using a
 964 subsequent Set-Document-Attributes operation.

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

969 The validation of the Set-Document-Attributes request is performed by the Printer as if the document had been
 970 submitted originally with the new attribute values (and the deleted attributes removed) and with "ipp-attribute-fidelity"
 971 set to 'true', i.e., all modified attributes Document attributes and values MUST be supported in combination with the
 972 Document attributes not modified. If such a Document Creation operation would have been accepted, then the Set-
 973 Document-Attributes MUST be accepted. If such a Document Creation operation would have been rejected, then the
 974 Set-Document-Attributes MUST be rejected and the Document MUST be unchanged. In addition, if any of the
 975 supplied attributes are not supported, are not settable, or the values are not supported, the Printer object MUST
 976 reject the entire operation; the Printer object MUST NOT partially set some of the supplied attributes. In other words,
 977 after the operation, all the supplied attributes MUST be set or none of them MUST be set, thus making the Set-
 978 Document-Attributes an atomic operation.

979 The Printer MUST accept or reject this operations when the Document's READ-ONLY "document-state" attribute has
 980 the values shown in Table 5. The document's current state MUST affect whether the Printer accepts or rejects the
 981 request. However, the Set-Document-Attributes operation MUST NOT change the state of the Document object
 982 (since the Document is a passive object and the Document state is a subset of the Job State). For example, in the
 983 case where the operation creates a request for unavailable resources, the Job (but not the Document) transitions to a
 984 new state. Table 5 shows the allowed behaviors in each document state.

985 **Table 5 - Document State Table for the Set-Document-Attributes operation**

Current "document-state"	New "document-state" (no change)	Printer's response status code and "action":
'pending'	'pending'	'successful-ok'
'pending'	'pending'	'successful-ok' - needed resources are not ready (the Job MAY change state, but the Document MUST NOT).
'processing'	'processing'	'successful-ok' or 'client-error-not-possible' depending on implementation, including the attributes being set, whether the document has started marking media, etc.
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

986

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

990 3.7.1 Settable and READ-ONLY Document Description attributes

991 If the Printer supports the Set-Document-Attributes operation, then it SHOULD support setting of:
992 all Document Template document ("xxx") attributes
993 that the implementation supports (see the column labeled "D" in Table 8).

994 Almost all Document Description attributes (see [RFC2911] section 4.3) MUST NOT be settable, i.e., they are
995 defined to be READ-ONLY. Only Document Description attributes marked with "(r/w)" in Table 8 MAY be settable
996 using Set-Document-Attributes. The Printer MUST reject a Set-Document-Attributes request that attempts to set any
997 attributes in Table 8 that is not marked "(r/w)".

998 Note: From now on, all extensions that define new object attributes will indicate whether or not the attributes are
999 READ-ONLY, by including the "READ-ONLY" adjective in their descriptions and/or explicitly stating whether they
1000 MAY be settable.

1001 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
1002 owner (as determined in the Job Creation operation) or an operator or administrator of the Printer object (see
1003 [RFC2911] Sections 1 and 8.5).

1004 3.7.2 Set-Document-Attributes Request

1005 The following sets of attributes are part of the Set-Document-Attributes Request:

1006 Group 1: Operation Attributes

1007 Natural Language and Character Set:

1008 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
1009 3.1.4.1.

1010 Target:

1011 The client MUST supply the "document-number" (integer(1:MAX)) operation attribute immediately after either
1012 (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which
1013 define the target Document object for this operation as described in [RFC2911] section 3.1.5. If the client
1014 omits the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-
1015 error-bad-request' status code.

1016 Note: There is no way in a single operation for the client to set all of a Job's Document objects to the same
1017 attribute value. Either (1) the client sets the corresponding attribute in each Document object in the Job with
1018 separate Set-Document-Attributes requests, or (2) the client sets the corresponding attribute at the Job Level
1019 using the Set-Job-Attributes operation. Setting the corresponding attribute at the Job Level (or supplying that
1020 attribute initially in the Job Creation operation) causes each Document object to inherit the Job Level
1021 attribute value, if the Document object doesn't have a corresponding explicit attribute supplied at the
1022 Document Level. In other words, supplying an attribute at the Job Levels will affect all the Job's Document
1023 objects that don't have that attribute also explicitly supplied at the Document Level.

1024 Requesting User Name:

1025 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
1026 [RFC2911] section 8.3.

1027 Group 2: Document Attributes

1028 The client MUST supply a set of Document Template attributes with one or more values (including explicitly
1029 allowed out-of-band values) as listed in column labeled "D" in Table 8 - Job Template and Document
1030 Template attributes and Document Description attributes flagged with "(r/w)" and listed in the column labeled
1031 "Doc" in Table 9 - Job and Document Description attributes, and any attribute extensions supported by the

1032 Printer. The value(s) of each Document attribute supplied in Group 2 replaces the value(s) of the
 1033 corresponding Document attribute on the target Document object. For attributes that can have multiple
 1034 values (1setOf), all values supplied by the client replace all values of the corresponding Document object
 1035 attribute.

1036 In order to set the Document's "document-message" Document Description attribute (see section 8.2.12), the
 1037 client MUST supply the attribute in Group 2, rather than supplying a "document-message" operation attribute
 1038 in Group 1.

1039 If the client supplies an "xxx" attribute with the 'delete-attribute' out-of-band value (see [set-ops] section 8.2),
 1040 the Printer MUST remove the "xxx" attribute from the Document object, if present.

1041 3.7.3 Set-Document-Attributes Response

1042 The Printer returns the following sets of attributes as part of the Set-Document-Attributes Response:

1043 Group 1: Operation Attributes

1044 Status Message:

1045 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
 1046 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
 1047 in [RFC2911] sections 13 and 3.1.6.

1048 Natural Language and Character Set:

1049 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
 1050 3.1.4.2.

1051 Group 2: Unsupported Attributes

1052 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

1053 If some of the attributes in the operation fail to validate, the Printer MUST reject the operation, MUST NOT
 1054 change any Document attributes, and MUST return the indicated status code below. In this group, the
 1055 Printer MUST also return all attributes that fail to validate. The following are the reasons that an attribute
 1056 fails to validate and the value returned for the attribute, along with the indicated status code and order of
 1057 detection:

- 1058 1. The number of attributes supplied by the client exceeds the maximum number that the Printer
 1059 supports in a Set-Printer-Attributes request: return the 'client-error-request-entity-too-large' (see
 1060 [RFC2911] section 13.1.4.9).
- 1061 2. The Printer doesn't support the attribute: return the attribute with the 'unsupported' out-of-band
 1062 attribute value (see [RFC2911] section 3.1.7 and [RFC2910]) and the 'client-error-attributes-or-
 1063 values-not-supported' (see [RFC2911] section 13.1.4.12).
- 1064 3. The attribute is READ-ONLY (in its definition) or is not-settable in this implementation: return the
 1065 attribute with the 'not-settable' out-of-band attribute value (see [set-ops] section 8.1) and the
 1066 'client-error-attributes-not-settable' status code (see [set-ops] section 7.1).
- 1067 4. The Printer doesn't support the value: if the attribute in the operation has a single value return it.
 1068 If the attribute in the operation is multi-valued, return only those values in a 1setOf that are not
 1069 supported. Return the 'client-error-attributes-or-values-not-supported' status code (see [RFC2911]
 1070 section 13.1.4.12).

- 1071 5. The values of some of the supplied attributes conflict with one another and/or other Document
 1072 attribute values not being set: if the conflicting attribute in the operation has a single value return
 1073 the attribute and the value. If the attribute in the operation is multi-valued, return only the attribute
 1074 and those values in a 1setOf that are conflicting with other attributes. Return the 'client-error-
 1075 conflicting-attributes' status code (see [RFC2911] section 13.1.4.15).

1076 3.8 Cancel-Document Operation

1077 This REQUIRED operation allows a client to cancel a specified Document in a specified Print Job from the time the
 1078 Document is created up to, but not including, the time it is completed, canceled, or aborted. Since a Document might
 1079 already be printing by the time a Cancel-Document is received, some media sheet pages might be printed before the
 1080 document processing is actually terminated.

1081 The Cancel-Document operation does not remove the Document from the Job and Printer, but only sets the specified
 1082 Document's "document-state" Document Description attribute to 'canceled' and the Document's "document-state-
 1083 reasons" Document Description attribute to 'canceled-by-user' or 'cancel-by-operator'. If the Job object is printed
 1084 again using operations such as the Reprocess-Job operation (see [adm-ops] section 4.1) or the Restart-Job
 1085 operation (see [RFC2911] section 3.3.7), any canceled Documents are also printed again. Thus Cancel-Document
 1086 has the same semantics as Cancel-Job (see [RFC2911] section 3.3.3), which only cancels the processing of the job,
 1087 and doesn't delete the Job object itself. See the Delete-Document operation (section 3.9) to remove the Document
 1088 object itself immediately from the Job and Printer.

1089 The Cancel-Document operation does not affect the states of any of the other Document objects in the job. If the Job
 1090 was processing and there are more Documents to be processed, the Printer does so. If there are no further
 1091 Documents to process, the Job moves to the 'completed' state as usual whenever there is no more processing to be
 1092 done.

1093 The Printer MUST accept or reject the request based on the document's current state and transition the document to
 1094 the indicated new state as follows:

Current "document-state"	New "document-state"	Printer object's response status code and action:
'pending'	'canceled'	'successful-ok'
'processing'	'canceled'	'successful-ok'
'processing'	'processing'	'successful-ok' See Rule 1
'processing'	'processing'	'client-error-not-possible' See Rule 2
'completed'	'completed'	'client-error-not-possible'
'canceled'	'canceled'	'client-error-not-possible'
'aborted'	'aborted'	'client-error-not-possible'

1095 Rule 1: If the implementation requires some measurable time to cancel the document in the 'processing' document
 1096 states, the Printer object MUST add the 'processing-to-stop-point' value to the document's "document-state-reasons"
 1097 attribute and then transition the document to the 'canceled' state when the processing ceases (see [RFC2911]
 1098 section 4.3.8).

1099 Rule 2: If the Document object already has the 'processing-to-stop-point' value in its "document-state-reasons"
 1100 attribute, then the Printer object MUST reject a Cancel-Document operation.

1101 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job
 1102 owner or an operator or administrator of the Printer object (see [RFC2911] sections 1 and 8.5). Otherwise, the
 1103 Printer MUST reject the operation and return: 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-
 1104 not-authorized' as appropriate.

1105 3.8.1 Cancel-Document Request

1106 The following groups of attributes are part of the Cancel-Document Request:

1107 Group 1: Operation Attributes

1108 Natural Language and Character Set:

1109 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
1110 3.1.4.1.

1111 Target:

1112 The client MUST supply the "document-number" (integer(1:MAX)) operation attribute immediately after either
1113 (1) the "printer-uri" (uri) plus "job-id" (integer(1:MAX)) or (2) the "job-uri" (uri) operation attribute(s) which
1114 define the target Document object for this operation as described in section [RFC2911] 3.1.5. If the client
1115 omits the "document-number" operation attribute, the Printer MUST reject the request and return the 'client-
1116 error-bad-request' status code.

1117 Requesting User Name:

1118 The "requesting-user-name" (name(MAX)) attribute SHOULD be supplied by the client as described in
1119 [RFC2911] section 8.3.

1120 3.8.1.1 document-message (text(427MAX))

operation attribute

1121 The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also
1122 support the corresponding "document-message" (text(427MAX)) Document Description attribute (see section
1123 8.2.12) and copy this value to the "document-message" Document Description attribute. The end user can
1124 use this Document Description attribute as a message to the operator and the operator can use it as a
1125 message to the user. The Printer MAY print this message on a document start sheet for this document, if
1126 any.

1127 The Printer MUST ignore the new "job-message-from-operator" operation attribute (see [adm-ops] section 6)
1128 for this operation, since that is a job only attribute and Cancel-Document is a Document operation.

1129 3.8.2 Cancel-Document Response

1130 The following sets of attributes are part of the Cancel-Document Response:

1131 Group 1: Operation Attributes

1132 Status Message:

1133 In addition to the REQUIRED status code returned in every response, the response OPTIONALLY includes a
1134 "status-message" (text(255)) and/or a "detailed-status-message" (text(MAX)) operation attribute as described
1135 in [RFC2911] sections 13 and 3.1.6.

1136 Natural Language and Character Set:

1137 The "attributes-charset" and "attributes-natural-language" attributes as described in [RFC2911] section
1138 3.1.4.2.

1139 Group 2: Unsupported Attributes

1140 See [RFC2911] section 3.1.7 for details on returning Unsupported Attributes.

1141 Once a successful response has been sent, the implementation guarantees that the Document will eventually end up
1142 in the 'canceled' state. Between the time of the Cancel-Document operation is accepted and when the document

1143 enters the 'canceled' document-state (see section 8.2.16), the "document-state-reasons" attribute (see section
 1144 8.2.18) SHOULD contain the 'processing-to-stop-point' value which indicates to later queries that although the
 1145 Document might still be 'processing', it will eventually end up in the 'canceled' state, not the 'completed' state.

1146 ~~3.10 Cancel Current Document Operation~~

1147 ~~This OPTIONAL operation allows a client to cancel either (1) any current Document of the current Job on the target~~
 1148 ~~Printer or (2) the specified document in a specified job if they are the current document and job on the Printer. One~~
 1149 ~~of the uses of this operation is by operators in an emergency, where the job-id and document-number might be~~
 1150 ~~unknown to the operator. See section 3.8 for the semantics of canceling a Document and what values the Printer~~
 1151 ~~sets the Document's Document Description attributes. Since a Document might already be marking by the time a~~
 1152 ~~Cancel Current Document is received, some media sheet pages might be printed before the document is actually~~
 1153 ~~terminated.~~

1154 ~~If the client does not supply a "job-id" and "document-number" operation attributes, the Printer MUST accept the~~
 1155 ~~request and cancel the current document if there is a current document in the 'processing' state; otherwise, it MUST~~
 1156 ~~reject the request and return the 'client-error-not-possible' status code. If more than one document is in the~~
 1157 ~~'processing' or 'processing-stopped' states, the one that is marking is canceled and the others are unaffected.~~

1158 ~~Warning: On a shared printer, there is a race condition. Between the time that a user issues this operation and its~~
 1159 ~~acceptance, the current document might change to a different document or even a different job. If the user or~~
 1160 ~~operator is authenticated to cancel the new job, the wrong document is canceled. To prevent this race from~~
 1161 ~~canceling the wrong document, the client MAY supply the "job-id" and "document-number" operation attributes which~~
 1162 ~~is checked against the current job's "job-id" and the current Document's "document-number". If the job identified by~~
 1163 ~~the "job-id" attribute is not the current job on the Printer and the "document-number" is not the current Document in~~
 1164 ~~that current Job, i.e., is not in the 'processing' state, the Printer MUST reject this operation and return the 'client-~~
 1165 ~~error-not-possible' status code. Otherwise, the Printer cancels the specified document.~~

1166 ~~Access Rights: The authenticated user (see [RFC2911] section 8.3) performing this operation must either be the job~~
 1167 ~~owner (as determined in the Job Creation operation) or an operator or administrator of the Printer object (see~~
 1168 ~~[RFC2911] Sections 4 and 8.5).~~

1169 ~~The Cancel Current Document Request and Cancel Current Document Response have the same attribute groups~~
 1170 ~~and attributes as the Pause Printer operation (see [RFC2911] section 3.2.8) with the addition of the following Group~~
 1171 ~~4 Operation attributes in the request:~~

1172 ~~3.10.1 job-id (integer(1:MAX))~~ ~~operation attribute~~

1173 ~~The client OPTIONALLY supplies this Operation attribute in order to verify that the identified job is still the~~
 1174 ~~current job on the target Printer object. The Printer MUST supports this operation attribute, if it supports this~~
 1175 ~~operation.~~

1176 ~~3.10.2 document-number (integer(1:MAX))~~ ~~operation attribute~~

1177 ~~The client OPTIONALLY supplies this Operation attribute in order to verify that the identified document is still~~
 1178 ~~the current document on the target Printer object. The Printer MUST supports this operation attribute, if it~~
 1179 ~~supports this operation.~~

1180 ~~3.10.3 document-message (text(127))~~ ~~operation attribute~~

1181 ~~The client MAY supply this operation attribute. If the Printer supports this attribute, the Printer MUST also~~
 1182 ~~support the corresponding "document-message" (text(127)) Document Description attribute (see section~~
 1183 ~~8.10) and copy this value to the "document-message" Document Description attribute. The end user can use~~

1184 ~~this Document Description attribute as a message to the operator and the operator can use it as a message~~
 1185 ~~to the user. The Printer MAY print this message on a document start sheet for this document, if any.~~

1186 ~~The Printer MUST ignore the new “job-message-from-operator” operation attribute (see [adm-ops] section 6) for this~~
 1187 ~~operation, since that is a job-only attribute and Cancel-Current-Documents is a Document operation.~~

1188 3.9 Delete-Document Operation

1189 This OPTIONAL operation removes the specified Document object and its data immediately from the specified Job.
 1190 The Printer MUST reject the request if the Document is in any state, but ‘pending’ (there is no ‘pending-held’ state for
 1191 Documents). The Printer does not reassign the “document-number” Document Description attribute values of the
 1192 remaining Document objects in the Job, so that the deleted Document object leaves a gap in the document
 1193 numbering space for the Job. The Printer MUST return a ‘client-error-not-found’ status code, in a subsequent Get-
 1194 Document-Attributes operation for this Document object specifying its former “document-number”. This operation is
 1195 similar to the Purge-Jobs operation which immediately deletes all jobs from the Printer. However, the Delete-
 1196 Document operation only deletes a single Document from the specified Job.

1197 *Access Rights:* The authenticated user (see [RFC2911] section 8.3) performing this operation MUST be an operator
 1198 or administrator of the Printer object (see [RFC2911] sections 1 and 8.5). Otherwise, the Printer MUST reject the
 1199 operation and return: ‘client-error-forbidden’, ‘client-error-not-authenticated’, or ‘client-error-not-authorized’ as
 1200 appropriate. This operation requires operator/administrator privileges, otherwise a rogue client could submit, then
 1201 delete, at will using up valuable spooling space. Instead of using this operation, unprivileged users use Cancel-
 1202 Document which goes through the normal accounting, if any.

1203 The Delete-Document request and Delete-Document response have the same attribute groups and attributes as the
 1204 Cancel-Document operation (see section 3.8).

1205 4 Semantic extensions to Job operations

1206 This section defines effects that Job operations have on the Document object. Printer and Subscription object (Event
 1207 Notification [ntfy]) operations MUST have no effect on the Document object and the Document object has no effect
 1208 on the semantics of the Printer and Subscription operations. The Job operations that MUST NOT have any effect on
 1209 the Document object because they are defined to affect the Job object as a whole are: **Get-Job-Attributes**⁶
 1210 ([RFC2911] section 3.3.4), **Get-Jobs**⁷ ([RFC2911] section 3.2.6), **Hold-Job** ([RFC2911] section 3.3.5), **Promote-Job**
 1211 ([adm-ops] section 4.4.1), **Release-Held-New-Jobs** ([adm-ops] section 3.3.2), **Resume-Job** ([adm-ops] section
 1212 4.3.2), **Schedule-Job-After** ([adm-ops] section 4.4.2), **Set-Job-Attributes** ([set-ops] section 4.2), and **Validate-Job**
 1213 ([RFC2911] section 3.2.3).

1214 The Job operations that affect Document objects or that Document objects affect the semantics of the Job operations
 1215 are, in alphabetical order:

⁶ The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Job-Attributes operation responses.

⁷ The Printer MUST NOT copy up to the Job object any Document attributes supplied at the Document Level in Create-Document, Send-Document, or Send-URI to the Job object as observable by the client in any Get-Job-Attributes operation responses.

1216 4.1 Cancel-Current-Job ([adm-ops] section 4.2)

1217 The Printer sets the “document-state” Document Description attribute to ‘canceled’ and the “document-state-reasons”
 1218 Document Description attribute to ‘canceled-by-xxx’ for any documents in the current Job that have not yet reached a
 1219 terminal state (‘completed’, ‘canceled’, or ‘aborted’), where “xxx” is ‘user’ or ‘operator’. See [adm-ops] section 4.2.

1220 4.2 Cancel-Job ([RFC2911] section 3.3.3)

1221 The Printer sets “document-state” Document Description attribute to ‘canceled’ and the “document-state-reasons”
 1222 Document Description attribute to ‘canceled-by-user’ or ‘canceled-by-operator’ for *all* Document objects in the
 1223 identified Job that have not yet reached a terminal state (‘completed’, ‘canceled’, or ‘aborted’).

1224 4.3 Job Creation operations

1225 This section defines the extensions to Job Creation operations.

1226 The following operation attribute extensions are defined for use in all the Job Creation operations and Validate-Job:

1227 4.3.1 ipp-attribute-fidelity (boolean) ([RFC2911] section 3.2.1 and 15)

1228 This REQUIRED operation attribute specifies the policy for the Printer to use (see [RFC2911] §3.2.1.1) when the
 1229 client supplies an unsupported attribute or value in a Job Creation operation or a subsequent Document Creation
 1230 operation for this job. The value ‘true’ indicates that total fidelity to client supplied Job Template and Document
 1231 Template attributes and values is required for this Job Creation operation and all subsequent Document Creation
 1232 operations for this job. If the client supplies the value ‘false’ or omits the attribute, then the Printer MUST accept the
 1233 Job Creation operation and all subsequent Document Creation operations even if the client supplies unsupported
 1234 attributes or values in them.

1235 The Printer MUST copy this attribute to the corresponding (new) Job Description attribute (see section 8.1.1) and use
 1236 its value for validating subsequent Document Creation operations for this job.

1237 Note: The inheritance of the effect of the “ipp-attribute-fidelity” operation attribute by subsequent Document Creation
 1238 operations is like the inheritance of other operation attributes.

1239 4.3.1.4.3.2 job-mandatory-attributes (1setOf type2 keyword) operation attribute

1240 This OPTIONAL operation attribute identifies which Job Template and Document Template attributes the Printer
 1241 MUST honor; in a this Job Creation operation request and all subsequent Document Creation requests for this job. ‡
 1242 ‡The Printer MUST reject the this Job Creation operation or any subsequent Document Creation operations for this
 1243 job, if the client supplies an unsupported Job Template or Document Template attribute or value in the request that is
 1244 also identified in this list. The client MAY supply this attribute in a Job Creation operations. If the Printer supports
 1245 this operation attribute, ‡the Printer MUST support this attribute in Job Creation operations and Validate-Job with any
 1246 values and MUST NOT support this attribute in any other operations.

1247 The values of the “job-mandatory-attributes” attribute are the keyword attribute names that identify Job Template
 1248 and/or Document Template attributes, for example, ‘job-hold-until’, ‘job-finishing’ (see section 7.1.4), ‘copies’ and
 1249 ‘media’. In order to identify a member attribute of a collection attribute, the keyword names of both the collection
 1250 attribute and the member attribute are given separated by a period (.) character. For example, to make the “media”
 1251 attribute of the “cover-front” collection attribute mandatory, supply the keyword value: ‘cover-front.media’.

1252 The Printer MUST ignore this attribute if the client supplies the "ipp-attribute-fidelity" operation attribute (see section
 1253 4.3.1) with a 'true' value in this operation, since a 'true' value indicates that the Printer MUST honor all supplied Job
 1254 Template and Document Template attributes.

1255 The Printer MUST copy this attribute to the corresponding "job-mandatory-attributes" Job Description attribute (see
 1256 section 4.3.2) for auditing and trouble shooting purposes and use its value for validating subsequent Document
 1257 Creation operations for this job.

1258 Note: The inheritance of the effect of "job-mandatory-attributes" operation attribute by subsequent Document
 1259 Creation operations is like the inheritance of other operation attributes.

1260 ~~ISSUE: OK that "job-mandatory-attributes" and "document-mandatory-attributes" are separate attributes so that~~
 1261 ~~there is no inheritance of must honor attributes from the Job level to the Document Level? If we did have inheritance,~~
 1262 ~~then we could simply have a single "mandatory-attributes" operation attribute that can be supplied in either/both Job~~
 1263 ~~Creation and Document creation operations.~~

1264 **4.3.3 Create-Job ([RFC2911] section 3.2.4)**

1265 The Printer creates the Job object with all of the mixture of Job and Document attributes supplied in the Create-Job
 1266 operation. The Document objects that are subsequently created for the specified Job inherit the Document attributes
 1267 from the Job object. However, the Printer MUST NOT **copy down** any Job Level attributes, including "document-
 1268 overrides" ([override]) to the Document object as observable by a client in any Get-Documents or Get-Document-
 1269 Attributes operation responses. The only exceptions to this no copy down rule are the four "compression",
 1270 "document-format", "document-name", and "document-natural-language" operation attributes which do not have any
 1271 corresponding Job Description attributes to hold them. Therefore, the Printer MUST copy down these attributes to
 1272 the Document object which does have Document Description attributes defined (see section 8.2).

1273 ISSUE 01: It is the [override] specification the allowed these four "compression", "document-format", "document-
 1274 name", and "document-natural-language" operation attributes to be supplied in the Create-Job request. There needs
 1275 to be a way for a client to query to see what was submitted. Possible solutions:

1276 a. OK to have the exception to the no copy down rule for these four which do not have any corresponding Job
 1277 Description attributes to hold them? Otherwise, there would be no queriable record of what the client had supplied
 1278 when the client only supplies them in the Create-Job operation.

1279 b. Or would it be better, simpler, and more consistent to define the four corresponding Job Description attributes and
 1280 have the Printer just copy the operation attributes to them, like most other operation attributes?

1281 c. Or should we forget the [override] extension and go back to the RFC2911 Create-Job definition (see [RFC2911]
 1282 section 3.2.4) which does not allow these four operation attributes to be submitted in the Create-Job, but requires
 1283 that the client supply them each time in each Send-Document and Sent-URI operation, if the client wants to submit
 1284 them at all. Then the Printer just copies them to the corresponding Document Description attributes and there is no
 1285 inheritance problem between the Job and Document level for these four attributes.

1286 A Printer that supports the Document object MUST support the Create-Job operation⁸ since the Create-Job operation
 1287 is the only operation that creates a Job object and allows subsequent Document objects to be created.

1288 **4.3.34.3.4 Print-Job ([RFC2911] section 3.2.1)**

1289 The Printer creates one Document object as a side effect of the Print-Job operation. All of the attributes supplied by
 1290 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on
 1291 the Document object because the Document object inherits them from the Job object. The Printer MUST populate

⁸ In [RFC2911] the Create-Job operation is OPTIONAL for a Printer to support.

1292 the single Document object's "document-state", "document-state-reasons", and "document-number" Document
1293 Description attributes with appropriate values. Thus a Get-Documents or Get-Documents-Attributes for a Job created
1294 by Print-Job will return no attributes supplied by the client, but will return the populated Document Description
1295 attributes.

1296 **4.3.4.3.5 Print-URI ([RFC2911] section 3.2.2)**

1297 The Printer creates one Document object as a side effect of the Print-URI operation. All of the attributes supplied by
1298 the client MUST remain at the Job Level as part of the Job object. Any Document attributes supplied have affect on
1299 the Document object because the Document object inherits them from the Job object. The Printer MUST populate
1300 the Document object's "document-state", "document-state-reasons", and "document-number" Document Description
1301 attributes with appropriate values. Thus a Get-Documents or Get-Documents-Attributes for a Job created by Print-Job
1302 will return no attributes supplied by the client, but will return the populated Document Description attributes.

1303 **4.4 Purge-Jobs ([RFC2911] section 3.2.9)**

1304 The Printer removes all Job and all of their contained Document objects.

1305 **4.5 Release-Job ([RFC2911] section 3.3.6)**

1306 The Printer moves the job to the 'pending' state, if there are no other "job-state-reasons" to hold the job. The values
1307 of the "document-state-reasons" attributes MUST NOT affect job scheduling (see Table 12), only the Job's "job-state-
1308 reasons" values.

1309 **4.6 Reprocess-Job ([adm-ops] section 4.1)**

1310 The Printer processes the Job again by processing *all* Documents in the Job, including ones that have been
1311 canceled by a previous Cancel-Documents operation. Therefore, the Printer removes any 'canceled-by-xxx' values
1312 from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes.

1313 **4.7 Restart-Job ([RFC2911] section 3.3.7)**

1314 The Printer starts the Job over again by processing *all* Documents in the Job, including ones that have been
1315 canceled by a previous Cancel-Documents operation. Therefore, the Printer removes any 'canceled-by-xxx' values
1316 from any of the "document-state-reasons" attributes and the Job's "job-state-reasons" attributes and

1317 **4.8 Send-Document ([RFC2911] section 3.3.1)**

1318 The Printer accepts a new Document Attributes group (Group 4) that the client can supply Document Template
1319 attribute and creates a Document object (see section 3.3).

1320 **4.9 Send-URI ([RFC2911] section 3.3.2)**

1321 The Printer accepts a new Document Attributes group (Group 4) that the client can supply Document Template
1322 attribute and creates a Document object (see section 3.4).

1323 4.10 Suspend-Current-Job ([adm-ops] section 4.3.1)

1324 The Printer suspends the current job and sets the Job's "job-state" Job Description attribute to 'processing-stopped'
 1325 and "job-state-reasons" to 'job-suspended-by-xxx', where 'xxx' is 'user' or 'operator'. The Documents' "document-
 1326 state" and "document-state-reasons" Document Description attributes are unaffected (but the Documents are not
 1327 processed any further, since the Job is stopped).

1328 5 Attribute Precedence during job processing

1329 This section defines the Attribute Precedence rules that the Printer MUST follow when processing jobs, including
 1330 instructions in the PDL data. These rules cover for-Queue Override attributes, Page Override attributes, Document
 1331 Object attributes, Document Override attributes, Job Object attributes, PDL instructions, PDL Interpreter initialization
 1332 files, and Printer object defaults. Since each attribute can be specified for all of these levels, it is important to define
 1333 which level takes precedence when the same attribute occurs at different levels with differing values.

1334 The attribute precedence model has the following features:

- 1335 1) In principle, each defined attribute can occur at each of the precedence levels.
- 1336 2) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1337 driver, submission client, protocol, and Printer:
 - 1338 • Attributes are supplied by different agents in the system: application, user, print driver, administrator,
 1339 operator, Printer object, and the output device hardware.
 - 1340 • Attributes are supplied at different points in time: PDL generation, job submission, job acceptance, job
 1341 pending, job processing.
- 1342 3) Attributes can be introduced and modified at different points in the job workflow, e.g., in the application, print
 1343 driver, submission client, protocol, and Printer.
- 1344 4) The later that an attribute is introduced into the work flow or the closer the specified scope of the attribute is
 1345 to the affected object, the higher the precedence is assigned to that attribute, since precedence is intended
 1346 to reflect the user's wishes.

1347 The following levels of Attribute Precedence are defined in order of decreasing priority:

- 1348 1. **queue override** - The value that the Printer enforces for any job submitted to it (see [prod-print2] section
 1349 3.1). Set by the administrator when configuring the Printer by setting an "xxx-supported" Printer attribute
 1350 to contain a single value, i.e., the override value. Example: the administrator sets the Printer's "sides" =
 1351 'two-sided-long' so that all jobs submitted to that (logical) Printer are printed two-sided flipped along the
 1352 long edge.

1353 Note: The **queue override** level is only available for Printers that support the 'guaranteed' value for
 1354 its "pdl-override-supported" attribute (see [prod-print2] section 8.1). All other levels are available for
 1355 all Printers independent of the "pdl-override-supported" value.

- 1356 2. **Document Level - page override programming** - The special "page-overrides" collection Document
 1357 Template attribute (see [override]) supplied at the Document Level, that is, in a Create-Document, Send-
 1358 Document, or Send-URI operation, that contains the attributes that are to have the page override status
 1359 for the specified ranges of pages in the Input-Document or the Output-Document. Supplied by the client
 1360 when submitting a Document object, or set by the user or operator after the Document has been

- 1361 accepted either using the Set-Document-Attributes operation, or by the operator using means local to the
 1362 Printer. Example: "page-overrides" = {"input-documents" = '1:1'; "pages-number" = '1:1'; "media" =
 1363 'letterhead'}
- 1364 3. **Job Level - page override programming** - The special "page-overrides" collection Job Template
 1365 attribute (see [override]) supplied at the Job Level, that is, in a Job Creation operation, that contains the
 1366 attributes that are to have the page override status for the specified ranges of pages in the Input-
 1367 Document or the Output-Documents. Supplied by the client when submitting a job either in the protocol,
 1368 or set by the user or operator after the job has been accepted either using the Set-Job-Attributes
 1369 operation, or by the operator using means local to the Printer. Example: "page-overrides" = {"input-
 1370 documents" = '1:1'; "pages-number" = '1:1'; "media" = 'letterhead'}
- 1371 4. **Document Level - Document object attributes** - The Document attributes supplied at the Document
 1372 Level, that is, in a Create-Document, Send-Document, or Send-URI operation to apply to the Input
 1373 Document. Supplied by the client when submitting a Document object, or set by the user or operator
 1374 after the Document has been accepted either using the Set-Job-Attributes operation, or by the operator
 1375 using means local to the Printer. Examples: "media" = 'na-letter' and "copies" = '2'.
- 1376 5. **Document Level - document override programming** - The special "document-overrides" collection
 1377 operation attribute (see [override]) supplied by the client in the Send-Document or Send-URI request.
 1378 The collection contains the member attributes that are to override attributes specified at lower
 1379 precedence for the specified range of documents, including the current Document and subsequently
 1380 created Documents. Clients that support the Document object SHOULD supply the attributes as
 1381 Document Template attributes directly when creating the Document, instead of using the operation
 1382 attribute mechanism. Example: "document-overrides" = {"input-documents" = '5:5'; "media" =
 1383 'transparency'}
- 1384 6. **Job Level - document override programming** - The special "document-overrides" collection Job
 1385 Template attribute (see [override]) that contains the attributes that are to have the document override
 1386 status for the specified Input-Documents or Output-Documents. Supplied by the client when submitting a
 1387 job either in the protocol, or set by the user or operator after the job has been accepted either using the
 1388 Set-Job-Attributes operation, or by the operator using means local to the Printer. Example: "document-
 1389 overrides" = {"input-documents" = '5:5'; "media" = 'transparency'}
- 1390 7. **Job Level - Job object and Document object attributes** - The Job attributes and Document attributes
 1391 supplied at the Job Level, i.e., with a Create-Job, Print-Job, or Print-URI operation. Supplied by the
 1392 client when submitting a Job in the protocol, or set by the user or operator after the job has been
 1393 accepted either using the Set-Job-Attributes operation, or by the operator using means local to the
 1394 Printer. Examples: "media" = 'na-letter' and "copies" = '2'.
- 1395 8. **PDL document data** - an instruction in the PDL document data. Supplied by the application or print
 1396 driver that created the PDL. Example: PostScript setPageDevice specifying na-letter media. Whether
 1397 PDL document data is actually lower precedence than the preceding levels depends on the
 1398 implementation as expressed in the "pdl-override-supported" Printer Description attribute (see
 1399 [RFC2911] section 4.4.28 and [prod-print2] section 8.1).
 1400
 1401 Job Template and Document Template attributes of the form "xxx-requested", such as "orientation-
 1402 requested" (see [RFC2911] section 4.2.10) have a lower priority than the PDL. If the PDL contains a
 1403 corresponding instruction, that PDL instruction will be used instead of the supplied "xxx-requested"
 1404 attribute. For example, PostScript PDL data always has a well-defined orientation, so that "orientation-
 1405 requested" never affects the result. On the other hand, PDLs such as text/plain never has orientation
 1406 and PCL NEED NOT have orientation, in which case, "orientation-requested" takes affect.
- 1407 9. **PDL Init File data** - a file that the Printer uses to initialize the PDL Interpreter before it starts interpreting
 1408 each document in a Job. See description of "pdl-init-file" Job Template attribute in [prod-print2] Section

1409 5.8. It is immaterial how this file is specified, whether it be by a queue override, job object attribute or
 1410 printer default – the precedence of the contents of this file is at this level.

1411 10. **printer default** - a Printer "xxx-default" attribute that is applied by the Printer provided that none of the
 1412 higher levels have supplied a value. The Printer implementation **MUST** supply values for all of the
 1413 Printer's "xxx-default" attributes that reflect the out-of-the-box action by the output device. For example,
 1414 if the output device will use media from the large-capacity input tray if not directed otherwise, the
 1415 implementation **MUST** supply the Printer's "media-default" attribute with the 'large-capacity' keyword
 1416 value without requiring the administrator to configure that value. The implementation **MUST** allow the
 1417 administrator to configure the Printer's "xxx-default" attributes to other values, if other value are
 1418 supported by the implementation. Example: The administrator changes the Printer's "media-default"
 1419 from 'large-capacity' to 'na-letter'.

1420 Note: Because of the requirement that the implementation supply pre-configured values for the
 1421 Printer's "xxx-default" attributes, there is no need for a lower "hardware default" precedence
 1422 level.

1423 6 Operation Attributes for the Job and Document Creation operations

1424 This section lists *all* the Operation attributes that have been defined in other IPP specifications that are used in Job
 1425 Creation operations and extends their use to the Document Creation operations defined in the IPP specification.
 1426 Operation attributes relate to the operation and do not depend on the printing capabilities of the Printer.

1427 6.1 Operation Attributes supplied at the Job and Document Levels for Creation

1428 Table 6 lists the Operation attributes that clients supply at the Job Level and/or the Document Level. ~~The value of
 1429 the "ipp-attribute-fidelity" operation attribute (see section) does not affect the Printer's handling of the other operation
 1430 attributes, only its handling of the Job Template and Document Template attributes (see section 7).~~

1431 The "Level Supplied" column indicates whether the Operation attribute can be supplied at the Job Level (Print-Job,
 1432 Print-URI, and Create-Job) and at the Document Level (Create-Document, Send-Document, and Send-URI) . The
 1433 Conformance column indicates the conformance requirements for what the client supplies in a request and the
 1434 Printer supports in a request. The Reference and Section columns list the IETF or IEEE-ISTO specification which
 1435 defines the semantics of the attribute.

1436 Legend:

- 1437 **[job-]** indicates an attribute that shouldn't have had a "job-" prefix in its name in [RFC2911], so that the same
 1438 attribute name could also be used for the Document object as a Document Description attribute. Note: For
 1439 the PWG Semantic Model, the "job-" prefix is dropped.
- 1440 "–" indicates that the Job or Document attribute is *not* defined.
- 1441 * these operation attributes are defined for *all* operations, not just Job Creation and Document Creation
 1442 operations
- 1443 ** For most of these operation attributes the Printer **MUST** copy these operation attributes to the corresponding
 1444 Job Description or Document Description attributes. The ** in the Job and Doc column indicate that there is
 1445 no corresponding Job Description or Document Description attribute, respectively. See Table 9 for the
 1446 corresponding Job and Document Description attributes.

Table 6 - Operation Attributes supplied at the Job and Document Levels in Creation Requests

Operation attribute name for Job and Document Creation requests	Attribute Syntax	Level Supplied		Conformance		Reference
		Job	Doc	Client supply	Printer support	
attributes-charset * **	charset	y	y	MUST	MUST	[RFC2911] §3.1.4
attributes-natural-language * **	naturalLanguage	y	y	MUST	MUST	[RFC2911] §3.1.4
compression **	type3 keyword	y **	y	MAY	MUST	[RFC2911] §3.2.1.1
document-format **	mimeMediaType	y **	y	MAY	MUST	[RFC2911] §3.2.1.1
document-mandatory-attributes **	1setOf type2 keyword	-	y	MAY	MAY	[this-spec] §1.1.1.1
document-message * **	text(127MAX)	-	y	MAY	MAY	[this-spec] §8.2.12
document-name **	name(MAX)	y **	y	MAY	MUST	[RFC2911] §3.2.1.1
document-natural-language **	naturalLanguage	y **	y	MAY	MAY	[RFC2911] §3.2.1.1
document-overrides	1setOf collection	-	y ⁹	MAY	MAY	[override] §5.1, §9.2.2
<i>See "document-overrides" in Table 8 for the list of member attributes</i>						
document-uri **	uri	y **	y	MAY ¹⁰ CMUST	MAY	[RFC2911] §3.2.2
input-document-number DEPRECATED	integer(1:MAX)	-	y	MAY	MAY	§3.1.1.1.1 [override] §9.2
ipp-attribute-fidelity **	boolean	y	y	MAY	MUST	§4.3.1.1 [RFC2911] §3.2.1.1
[job-]impressions	integer(0:MAX)	y	y	MAY	MAY	[RFC2911] §3.2.1.1
[job-]k-octets **	integer(0:MAX)	y	y	MAY	MAY	[RFC2911] §3.2.1.1
job-mandatory-attributes	1setOf type2 keyword	y	-	MAY	MAY	§4.3.2
[job-]media-sheets	integer(0:MAX)	y	y	MAY	MAY	[RFC2911] §3.2.1.1
job-name **	name(MAX)	y	-	MAY	MUST	[RFC2911] §4.3.5
job-password **	octetString(255)	y	-	MAY	MAY	[prod-print2] §4.1
job-password-encryption **	type3 keyword name(MAX)	y	-	MAY	MAY	[prod-print2] §4.2
last-document **	boolean	-	y **	MUST	MUST	[RFC2911] §3.3.1.1
operation-id *	integer(1:0x8FFF)	y **	y **	MUST	MUST	[RFC2911] §3.1.2
original-requesting-user-name	name(MAX)	y	y	MAY	MAY	[adm-ops] §11.7.2.2
page-overrides	1setOf collection	-	y ¹¹	MAY	MAY	[override] §5.2, §9.2.3
<i>See "page-overrides" in Table 8 for the list of member attributes</i>						
printer-uri *	uri	y ¹²	y	MUST	MUST	[RFC2911] §3.1.5
request-id *	integer(1:MAX)	y **	y **	MUST	MUST	[RFC2911] §3.1.2
requesting-user-name *	name(MAX)	y **	y **	SHOULD	MUST	[RFC2911] §3.2.1.1
version-number *	X.Y	y **	y **	MUST	MUST	[RFC2911] §3.1.8

⁹ See section 6.2 for an ISSUE about DEPRECATING "document-overrides" as an operation attribute.

¹⁰ The "document-uri" operation attribute MUST be supplied in the Print-URI Job Creation operation and the Send-URI Document Creation operation, ~~MAY be supplied in a Validate Document operation~~, and MUST NOT be supplied in other operations.

¹¹ See section 6.2 for an ISSUE about DEPRECATING "page-overrides" as an operation attribute.

¹² The Printer copies the "printer-uri" operation attribute to the Job's "job-printer-uri" Job Description attribute and Document's "job-printer-uri" Document Description attribute.

1448 * and **. See Legend at the beginning of the Table.

1449 **6.2 Override operation attributes in Send-Document and Send-URI**

1450 According to [override], the “document-overrides” (collection) attribute MAY be supplied by the client in a Send-
 1451 Document or Send-URI request as an Operation attribute to apply document overrides to this and/or subsequent
 1452 documents in the job. See the “document-overrides” Job Template attribute in Table 8 for the listing of the member
 1453 attributes. However, with the introduction of the Document object, the “document-overrides” (collection) attribute
 1454 SHOULD NOT be used (either as a Job Template attribute or an Operation attribute). Instead, the client simply
 1455 supplies the Document Template attributes (see Table 8) for each Document Creation request (in a new Document
 1456 Template attribute group) without needing a collection. A Printer MAY support “document-overrides” as specified in
 1457 [override] for backward compatibility with clients that don’t support the Document object.

1458 **ISSUE 02: Should we DEPRECATE the use of the “document-overrides” operation attribute in Send-Document and**
 1459 **Send-URI when supporting this specification? Or forbid?**

1460 The “document-overrides” attribute is also useful in combination with the “pages-per-subset” attribute (see
 1461 [overrides]) which divides up the Input Page stream concatenated across the Input Documents into separate Output
 1462 Documents. For example, making every 10 Input Pages be a separate Output Document but the client only wants to
 1463 staple the first Output Document.

1464 Similarly, according to [override], the “page-overrides” (collection) attribute MAY be supplied by the client in a Send-
 1465 Document or Send-URI request as an Operation attribute to apply page overrides to this and/or subsequent
 1466 documents in the job. See the “page-overrides” Job Template attribute in Table 8 for the listing of the member
 1467 attributes. However, with the introduction of the Document object, the “page-overrides” (collection) attribute
 1468 SHOULD be more simply supplied as one of the Document Template attributes for the document being created only.
 1469 However, a Printer MAY also support the “page-overrides” attribute as an operation attribute for backward
 1470 compatibility with clients that do not support the Document object.

1471 **ISSUE 03: Should we DEPRECATE the use of the “pages-overrides” operation attribute in Send-Document and**
 1472 **Send-URI when supporting this specification? Or forbid?**

1473 **6.3 Operation Attributes returned in Job and Document Creation responses**

1474 Table 7 lists the Operation attributes that Printers return in Job Creation operation *responses*: Print-Job, Print-URI,
 1475 and Create-Job and in Document Creation operation *responses*: Send-Document and Send-URI. The column
 1476 labeled “Conformance” indicates the conformance for what the Printer returns and what the Printer supports. The
 1477 Reference and Section columns list the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

1478 **Table 7 - Operation attributes returned in Job and Document Creation operation responses**

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
attributes-charset *	charset	MUST	MUST	[RFC2911] §3.1.4
	‘utf-8’	MAY	MUST	[RFC2911] §4.1.7
	‘us-ascii’	MAY	MAY	[RFC2911] §4.1.7
	‘iso-8859-1’	MAY	MAY	[RFC2911] §4.1.7
	‘iso-10646-ucs-2’	MAY	MAY	[RFC2911] §4.1.7
attributes-natural-language *	naturalLanguage	MUST	MUST	[RFC2911] §3.1.4
	‘en-US’	MAY	MAY	[RFC2911] §4.1.8

Operation attribute name	Attribute Syntax Values	Conformance		References
		Printer return	Printer support	
detailed-status-message *	text	MAY	MAY	[RFC2911] §3.1.6.3
document-access-error	text	MAY	MAY	[RFC2911] §3.1.6.4
document-id-uri	uri	MUST	MUST	[this spec] §8.2.11
document-number	integer(1:MAX)	MUST	MUST	[this spec] §8.2.15
job-id	integer(1:MAX)	MUST	MUST	[RFC2911] §4.3.2
job-uri	uri	MUST	MUST	[RFC2911] §4.3.1
redirect-uri (uri) ¹³	uri	MAY	MAY	[not-srv] §5.2
request-id *	integer(1:32767)	MUST	MUST	[RFC2911] §3.1.2
status-code *	integer(0:32767)	MUST	MUST	[RFC2911] §3.1.6.1
status-message *	text(255)	MAY	MAY	[RFC2911] §3.1.6.2
version-number *	integer(1:255), integer(0:255)	MUST	MUST	[RFC2911] §3.1.8

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

7 Job Template and Document Template attributes

Table 8 lists *all* of the Job Template attributes defined in other IPP specifications and lists their corresponding Document Template attributes defined in this IPP specification. The Job Template attributes can be supplied in the Job Creation operations: Print-Job, Print-URI, and Create-Job operations.

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

These Document Template attributes can also be supplied as Document Overrides using the “document-overrides” Job Template attribute (see [overrides]).

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

Most Job Template and Document Template attributes correspond to the PWG Semantic Model Job Processing and Document Processing attributes, respectively. However, a few of the IPP Job Template attributes are represented in the PWG Semantic Model as Job Description attributes, instead of Job Processing attributes. These are indicated in the first column with (JD).

¹³ The Printer or Notification Server returns the “redirect-uri” operation attribute in order to redirect the Get-Notification operation to a Notification Server or back to the original Printer.

1497 The “Defined for use” column indicates whether the client MAY supply and the Printer support the attribute at the
 1498 Job, Document, or Page Level with the following semantics:

Supplied	Description
J=y:	Job Level: The attributes MAY be supplied as Job Template attributes at the Job Level in a Job Creation request (Print-Job, Print-URI, Create-Job) in which case each Document inherits the Job Template attribute as a default which is used unless an attribute at the document level is also supplied. Note: The “multiple-document-handling” attribute controls whether extensive attributes, such as “finishing”, “copies”, affect the entire job as a whole (‘single-xxx’ values) or affect each document separately (‘separate-xxx’ values).
D=y:	Document Level: The attribute MAY be supplied at the Document Level as Document Template attributes in a Document Creation operation (Send-Document, Send-URI), in which case the supplied Document Templates override any Job Template attributes supplied at the Job Level and any “document-overrides” supplied at the Job or Document level.
P=y:	Page Level: The attribute MAY be supplied as a member of the (1) “page-ranges” Job Template attribute at the Job Level in a Job Creation operation or (2) “page-ranges” Document Template attribute at the Document Level to affect the specified range of pages.

1499 Job Template and Document Template attributes are OPTIONAL for a Printer to support and for a client to supply in
 1500 a Job Creation or Document Creation request or a Document Overrides or Page Overrides. If a Printer supports a
 1501 Job Template or Document Template attribute, then it MUST copy the supplied attribute to the Job or Document
 1502 object, respectively so that a client MAY query the attributes in subsequent Get-Job-Attributes/Get-Jobs and Get-
 1503 Document-Attributes/Get-Documents operations, respectively. The effect of Job Template Attributes supplied in Job
 1504 Creation requests are inherited by the Document objects, unless the Document Creation operation supplies the
 1505 attribute with a different value.
 1506

1507 If a Job Template collection attribute is supported (see [coll]), then there are conformance requirements for which
 1508 member attributes MUST be supported and which member attributes a client MUST supply as indicated in the
 1509 Conformance column for each collection member attribute in Table 8.

1510 **Table 8 - Job Template and Document Template attributes**

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
copies	integer(1:MAX)	y ¹⁴	y	n	MAY	MAY	[RFC2911] §4.2.5

¹⁴ The IPP “copies” attribute is an *extensive* attribute, so its effect when supplied at the job level is not always inherited by the documents in a multi-document job. Instead, its effect depends on the value of the “multiple-document-handling” Job Template attribute. The ‘single-document’ and ‘single-document-new-sheet’ values produce copies of the job as a whole with the multiple input documents concatenated into a single output document for each job copy. The ‘separate-document-uncollated-copies’ value produce N copies of the first input document followed by N copies of the second input document, etc. The ‘separate-document-collated-copies’ produce N successive job copies, each job copy consisting of 1 copy of the first document followed by 1 copy of the second document, etc.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
cover-back	collection	y	y	n	MAY	MAY	[prod-print] §3.1
cover-type	type2 keyword				MUST	MUST	[prod-print] §3.1.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.1.1
media-col	collection					MAY	[prod-print] §3.1.1
cover-front	collection	y	y	n	MAY	MAY	[prod-print] §3.1
cover-type	type2 keyword				MUST	MUST	[prod-print] §3.1.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.1.1
media-col	collection					MAY	[prod-print] §3.1.1
document-overrides	collection	y	y ¹⁵	n	MAY	MAY	[override] §5.1
input-documents ¹⁶	1setOf rangeOfInteger(MAX)				MUST be one or the other, but NOT both	MUST	[override] §5.1.1
output-documents	1setOf rangeOfInteger(MAX)					MUST	[override] §5.1.2
document-copies	1setOf rangeOfInteger(MAX)				MAY	MAY	[override] §5.1.3
document-format	mimeMediaType				MAY	MUST	[override] §5.1.4
document-name	name (MAX)				MAY	MUST	[override] §5.1.5
compression	type3 keyword				MAY	MUST	[override] §5.1.6
document-natural-language	naturalLanguage				MAY	MAY	[override] §5.1.7
page-ranges	1setOf rangeOfInteger (1:MAX)				MAY	MAY	[override] §5.1.8
<i>any other Job Template attributes that affect documents, such as "media" or "media-col"</i>					MAY	MAY	
feed-orientation	type3 keyword	y	y	n	MAY	MAY	[prod-print2] §5.1
finishings	1setOf type2 enum	y ¹⁷	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "finishing-col" is supported	[RFC2911] §4.2.6 [finish] §2
finishings-col	collection	y ¹⁸	y	y			MAY
finishing-template	name(MAX)				MAY	MAY	[prod-print] §3.2.1
stitching	collection				MAY	MAY	[prod-print] §3.2.2
stitching-reference-edge	type2 keyword				MUST	MUST	[prod-print] §3.2.2.1
stitching-offset	integer (0:MAX)				MUST	MUST	[prod-print] §3.2.2.2
stitching-locations	1setOf integer(0:MAX)				MUST	MUST	[prod-print] §3.2.2.3
font-name-requested	name(MAX)	y	y	y	MAY	MAY	[prod-print2] §5.2
font-size-requested	integer (1:MAX)	y	y	y	MAY	MAY	[prod-print2] §5.3
force-front-side	1setOf integer(1:MAX)	y ¹⁹	y	y	MAY	MAY	[prod-print] §3.3

¹⁵ See section 6.2 for an ISSUE about DEPRECATING "document-overrides" as an operation attribute.

¹⁶ The Printer MUST support "document-format", "document-name", "compression", "document-natural-language", and "page-ranges" with the "input-documents" member attribute, but not with the "output-documents" member attribute.

¹⁷ The IPP "finishings" and "finishings-col" attributes are *extensive* attributes, so their effect when supplied at the Job Level is not always inherited by the documents in a multi-document job. Instead, their effect depends on the value of the "multiple-document-handling" Job Template attribute. The 'single-document' and 'single-document-new-sheet' cause the finishing to be applied to each job copy as a whole. The 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values cause the finishing to be applied to each document.

¹⁸ See the footnote on the "finishings" attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
imposition-template	type2 keyword name(MAX)	y	y	y	MAY	MAY	[prod-print] §3.4
insert-sheet	1setOf collection	y ²⁰	y	y	MAY	MAY	[prod-print] §3.5
insert-after-page-number	integer(0:MAX)				MUST	MUST	[prod-print] §3.5.1
insert-count	integer(0:MAX)				MAY	MUST	[prod-print] §3.5.2
media	type3 keyword name(MAX)				MUST be one or the other, but NOT both	MUST	[prod-print] §3.5.3
media-col	collection					MAY	[prod-print] §3.5.3
job-account-id (JD)	name(MAX)	y	n	n	MAY	MAY	[prod-print] §3.6
job-accounting-sheets	collection	y	n	n	MAY	MAY	[prod-print] §3.8
job-accounting-sheets-type	type3 keyword name(MAX)				MUST	MUST	[prod-print] §3.8.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.8.2
media-col	collection					MAY	[prod-print] §3.8.2
job-accounting-output-bin	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.8.3
job-accounting-user-id (JD)	name(MAX)	y	n	n	MAY	MAY	[prod-print] §3.7
job-copies	integer(1:MAX)	y	n ²¹	n	MAY	MAY	[this spec] §7.1.1

¹⁹ The effect of the IPP “force-front-side” and “insert-sheet” attributes when supplied at the job level of a multi-document job depends on the value of the “multiple-document-handling” Job Template attribute. For the ‘single-document’ and ‘single-document-new-sheet’ values, the pages are numbered as a single set from 1 to n for the job as a whole. For the ‘separate-documents-collated-copies’ and ‘separate-document-uncollated-copies’ values, the pages are numbered from 1 to n for each document separately.

²⁰ See the footnote on “force-front-side”.

²¹ The “job-copies” Job Template attribute MUST NOT be supplied at the Document or Page Level. The “job-copies” Job Template attribute was introduced for use in clients or Printers that don’t support “multiple-document-handling” = ‘single-document’ or ‘single-document-new-sheet’.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-cover-back <i>same as cover-back</i>	collection see cover-back	y	n ²²	n	MAY	MAY	[this-spec] §7.1.2
job-cover-front <i>same as cover-front</i>	collection see cover-front	y	n ²³	n	MAY	MAY	[this-spec] §7.1.3
job-error-sheet	collection	y	n	n	MAY	MAY	[prod-print] §3.9
job-error-sheet-type	type3 keyword name(MAX)				MUST	MUST	[prod-print] §3.9.1
job-error-sheet-when	type2 keyword				MAY	MAY	[prod-print] §3.9.2
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.9.3
media-col	collection					MAY	[prod-print] §3.9.3
job-finishings	1setOf type2 enum	y	n ²⁴	n	MAY	MAY	[this-spec] §7.1.4
job-finishings-col <i>same as finishings-col</i>	collection see finishings-col	y	n ²⁵	n	MAY	MAY	[this-spec] §7.1.5
job-hold-until	type3 keyword name(MAX)	y	n	n	MAY	MAY	[RFC2911] §4.2.2
job-hold-until-time	dateTime	y	n	n	MAY	MAY	[prod-print2] §5.4
job-message-to-operator	text(MAX)	y	n ²⁶	n	MAY	MAY	[prod-print] §3.10
job-phone-number	text(127)	y	n	n	MAY	MAY	[prod-print2] §5.5
job-priority	integer(1:100)	y	n	n	MAY	MAY	[RFC2911] §4.2.1
job-recipient-name (JD)	name(MAX)	y	n	n	MAY	MAY	[prod-print2] §5.6
job-save-disposition	collection	y	n	n	MAY	MAY	[prod-print2] §5.7
save-disposition	type3 keyword	y	n	n	MAY	MAY	[prod-print2] §5.7.1.1
save-info	1setOf collection	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2
save-location	uri	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2.3.1
save-name	name(MAX)	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2.3.2
save-document-format	mimeMediaType	y	n	n	MAY	MAY	[prod-print2] §5.7.1.2.3.3
job-sheet-message	text(MAX)	y	n	n	MAY	MAY	[prod-print] §3.12

²² The “job-cover-back” Job Template attribute MUST NOT be supplied at the Document or Page Level. The “job-cover-back” Job Template attribute was introduced for use in clients or Printers that don’t support “multiple-document-handling” = ‘single-document’ or ‘single-document-new-sheet’.

²³ The “job-cover-front” Job Template attribute MUST NOT be supplied at the Document or Page Level. The “job-cover-front” Job Template attribute was introduced for use with clients or Printers that don’t support “multiple-document-handling” = ‘single-document’ or ‘single-document-new-sheet’.

²⁴ The “job-finishing” Job Template attribute MUST NOT be supplied at the Document or Page Level. The “job-finishings” Job Template attribute was introduced for use with clients or Printers that don’t support “multiple-document-handling” = ‘single-document’ or ‘single-document-new-sheet’.

²⁵ The “job-finishing-col” Job Template attribute MUST NOT be supplied at the Document or Page Level. The “job-finishings-col” Job Template attribute was introduced for use with clients or Printers that don’t support “multiple-document-handling” = ‘single-document’ or ‘single-document-new-sheet’.

²⁶ The “job-message-to-operator” Job Template attribute has no corresponding Document Template attribute. Instead, the user and operator communicate with each other using the same “document-message” operation attribute which the Printer copies to the “document-message” Document Description attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
job-sheets	type3 keyword name(MAX)	y	n	n	MAY be neither or one of, but NOT both	MAY, MUST if "job-sheets-col" supported	[RFC2911] §4.2.3
job-sheets-col	collection	y	n	n		MAY	[prod-print] §3.11
job-sheets	type3 keyword name(MAX)				MUST	MUST	[prod-print] §3.11.1
media	type3 keyword name(MAX)				MUST be one or the other, but NOT both	MUST	[prod-print] §3.11.2
media-col	collection					MAY	[prod-print] §3.11.2
media	type3 keyword name(MAX)	y	y	y	MAY be neither or one of, but NOT both	MAY, MUST if "media-col" supported	[RFC2911] §4.2.11
media-col	collection	y	y	y		MAY	[prod-print] §3.13
media-back-coating	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.10
media-color	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.4
media-front-coating	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.10
media-grain	type3 keyword name(MAX)				MAY	MAY	[prod-print2] §8.4.2
media-hole-count	integer(0:MAX)				MAY	MAY	[prod-print] §3.13.6
media-info	text(255)				MAY	MAY	[prod-print] §3.13.3
media-key	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.1
media-material	type3 keyword name(MAX)				MAY	MAY	[prod-print2] §8.4.3
media-order-count	integer(1:MAX)				MAY	MAY	[prod-print] §3.13.7
media-preprinted	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.5
media-recycled	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.11
media-size	collection				MAY	MUST	[prod-print] §3.13.8
x-dimension	integer(0:MAX)				MUST	MUST	[prod-print] §3.13.8.1
y-dimension	integer(0:MAX)				MUST	MUST	[prod-print] §3.13.8.2
media-size-name	<u>type3 keyword name(MAX)</u>				<u>MAY</u>	<u>MAY</u>	<u>§7.1.6</u>
media-thickness	integer(1:MAX)				MAY	MAY	[prod-print2] §8.4.4
media-tooth	type3 keyword name(MAX)				MAY	MAY	[prod-print2] §8.4.1
media-type	type3 keyword name(MAX)				MAY	MAY	[prod-print] §3.13.2
media-weight-metric	integer(0:MAX)				MAY	MAY	[prod-print] §3.13.9
media-input-tray-check	type3 keyword name(MAX)	y	y	y	MAY	MAY	[prod-print] §3.14
media-size-name ²⁷	<u>type3 keyword name(MAX)</u>	<u>y</u>	<u>y</u>	<u>y</u>	<u>MAY</u>	<u>MAY</u>	<u>§7.1.6, [upnp]</u>
media-type ²⁸	<u>type3 keyword name(MAX)</u>	<u>y</u>	<u>y</u>	<u>y</u>	<u>MAY</u>	<u>MAY</u>	<u>[upnp], [prod-print] §3.13.2</u>

²⁷ UPnPv1 and UPnPv2 define a separate MediaSizeName Job Template attribute with values from PWG 5101.1.

²⁸ UPnPv1 and UPnPv2 define a separate MediaType Job Template attribute with the same values as the "media-type" member attribute of "media-col".

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
multiple-document-handling	type2 keyword	y	n	n	MAY	MUST if multiple document jobs supported	[RFC2911] §4.2.4
number-up	integer(1:MAX)	y	y	y	MAY	MAY	[RFC2911] §4.2.9
orientation-requested	type2 enum	y	y	y	MAY	MAY	[RFC2911] §4.2.10
output-bin	type2 keyword name(MAX)	y	n	n	MAY	MAY	[output-bin] §2.1
page-delivery	type2 keyword	y	y	n	MAY	MAY	[prod-print] §3.15
page-order-received (JD)	type2 keyword	y	y	n	MAY	MAY	[prod-print] §3.16
page-overrides	1setOf collection	y ²⁹	y	n	MAY	MAY	[override] §5.2
input-documents	1setOf rangeOfInteger(1:MAX)				MUST be one or the other, but NOT both	MUST	[override] §5.2.1
output-documents	1setOf rangeOfInteger(1:MAX)					MUST	[override] §5.2.2
document-copies	1setOf rangeOfInteger(1:MAX)				MAY	MAY	[override] §5.2.3
pages	1setOf rangeOfInteger(1:MAX)				MUST	MUST	[override] §5.2.4
<i>any other Job Template attributes that affect pages, such as "media" or "media-col"</i>					MAY	MAY	
page-ranges	1setOf rangeOfInteger(1:MAX)	y ³⁰	y	n	MAY	MAY	[RFC2911] §4.2.7
pages-per-subset	1setOf integer(1:MAX)	y ³¹	n	n	MAY	MAY	[prod-print] §5.3
pdl-init-file	1setOf collection	y	y	n	MAY	MAY	[prod-print2] §5.8
pdl-init-file-location	uri				MAY	MAY	[prod-print2] §5.8.1.1
pdl-init-file-name	name(MAX)				MAY	MAY	[prod-print2] §5.8.1.2
pdl-init-file-entry	name(MAX)				MAY	MAY	[prod-print2] §5.8.1.3
presentation-direction-number-up	type2 keyword	y	y	y	MAY	MAY	[prod-print] §3.17
print-quality	type2 enum	y	y	y	MAY	MAY	[RFC2911] §4.2.13
printer-resolution	resolution	y	y	y	MAY	MAY	[RFC2911] §4.2.12

²⁹ The effect of the IPP "page-overrides" Job Template attribute when supplied at the job level of a multi-document job depends on the value of the "multiple-document-handling" Job Template attribute. For the 'single-document' and 'single-document-new-sheet' values, the pages are numbered as a single set from 1 to n for the job as a whole. For the 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values, the pages are numbered from 1 to n for each document separately. **ISSUE 06: This is a change from [override], OK?**

³⁰ The effect of the IPP "page-ranges" Job Template attribute when supplied at the job level of a multi-document job depends on the value of the "multiple-document-handling" Job Template attribute. For the 'single-document' and 'single-document-new-sheet' values, the pages are numbered as a single set from 1 to n for the job as a whole. For the 'separate-documents-collated-copies' and 'separate-document-uncollated-copies' values, the pages are numbered from 1 to n for each document separately. **ISSUE 07: This is a change from [override], OK?**

³¹ The IPP "pages-per-subset" Job Template attribute MUST be supplied at the Job Level and can only be used when the "multiple-document-handling" Job Template attribute is 'separate-documents-collated-copies' or 'separate-documents-uncollated-copies', since the purpose of the "pages-per-subset" attribute is to produce separate output documents for each subset. Otherwise, the Printer MUST ignore the "pages-per-subset" attribute.

Job Template / Document Template attribute name	Attribute Syntax	Defined for use			Conformance		Reference
		J	D	P	Client supply	Printer support	
proof-print	collection	y	n	n	MAY	MAY	[prod-print2] §5.9
proof-print-copies	integer (0:MAX)	y	n	n	MAY	MAY	[prod-print2] §5.9.1.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print2] §5.8.1.2
media-col	collection					MAY	[prod-print2] §5.8.1.2
separator-sheets	collection	y	y	n	MAY	MAY	[prod-print] §3.18
separator-sheets-type	type3 keyword name(MAX)				MUST	MUST	[prod-print] §3.18.1
media	type3 keyword name(MAX)				MAY be neither or one of, but NOT both	MUST	[prod-print] §3.18.2
media-col	collection					MAY	[prod-print] §3.18.2
sheet-collate	type2 keyword	y	y	n	MAY	MAY	[job-prog] §3.1
sides	type2 keyword	y	y	y	MAY	MAY	[RFC2911] §4.2.8
x-image-position	type2 keyword	y	y	y	MAY	MAY	[prod-print] §3.19.2
x-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.3
x-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.4
x-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.5
y-image-position	type2 keyword	y	y	y	MAY	MAY	[prod-print] §3.19.6
y-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.7
y-side1-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.8
y-side2-image-shift	integer(MIN:MAX)	y	y	y	MAY	MAY	[prod-print] §3.19.9

1511

1512 **7.1 Job Template attributes defined for use with the Document object multi-**
 1513 **document jobs**

1514 This section defines additional Job Template attributes for use with the Document object.

1515 **7.1.1 job-copies (integer(1:MAX))** ~~Job Template attribute~~

1516 This attribute specifies the number of job copies, i.e., with all of the Document objects taken together. Its
 1517 interpretation is independent of the value of the “multiple-document-handling” Job Template attribute. See the
 1518 “copies” Job Template attribute defined in [RFC2911] section 4.2.5 which switches between job copies and
 1519 document copies depending on the value of the “multiple-document-handling” Job Template attribute.

1520 **7.1.2 job-cover-back (collection)** ~~Job Template attribute~~

1521 This attribute specifies the cover for the back of the job, i.e., with all of the Document objects taken together and is
 1522 independent of the value of the “multiple-document-handling” Job Template attribute. The member attributes are the
 1523 same as “cover-back” (see [prod-print] section 3.1). However, the “cover-back” Job Template attribute switches
 1524 between a job back cover and a document back cover depending on the value of the “multiple-document-handling”
 1525 Job Template attribute.

1526 **7.1.3 job-cover-front (collection)** ~~Job Template attribute~~

1527 This attribute specifies the cover for the front of the job, i.e., with all of the Document objects taken together and is
 1528 independent of the value of the “multiple-document-handling” Job Template attribute. The member attributes are the
 1529 same as the “cover-front” Job Template attribute (see [prod-print] section 3.2). However, the “cover-front” Job

1530 Template attribute switches between a job front cover and a document front cover depending on the value of the
1531 "multiple-document-handling" Job Template attribute.

1532 **7.1.4 job-finishings (1setOf type2 enum)** ~~Job Template attribute~~

1533 This attribute specifies the job finishings, i.e., with all of the Document objects taken together. Its interpretation is
1534 independent of the value of the "multiple-document-handling" Job Template attribute. See the "finishings" Job
1535 Template attribute defined in [RFC2911] section 4.2.6 which switches between job finishings and document
1536 finishings depending on the value of the "multiple-document-handling" Job Template attribute.

1537 **7.1.5 job-finishings-col (1setOf collection)** ~~Job Template attribute~~

1538 This attribute specifies the job finishings collection, i.e., with all of the Document objects taken together. Its
1539 interpretation is independent of the value of the "multiple-document-handling" Job Template attribute. See the
1540 "finishings" Job Template attribute defined in [RFC2911] section 4.2.6 which switches between job finishings
1541 collection and document finishings collection depending on the value of the "multiple-document-handling" Job
1542 Template attribute.

1543 **7.1.6 media-size-name (type3 keyword | name(MAX))**

1544 This Job Template and Document Template attribute specifies the name of a size of media. The values are defined
1545 in [pwg5101.1]. The attribute is used in [upnp] as a Job Template attribute. Examples:

1546 'na letter 8.5x11in' - The letter size (8.5 inches by 11 inches) used in North America.
1547 'iso a4 210x297mm' - The iso A4 size (210 mm by 297 mm) used in metric countries.
1548

1549 **7.2 Document Template attributes**

1550 Most Job Template attributes can be used as Document Template attributes for use in Document Creation
1551 operations to apply to the Document object. However, the Job Template attributes that have the "job-" prefix MUST
1552 NOT be used as Document Template attributes, since they are defined to apply to the job as a whole. Table 8 shows
1553 lists all of the Document Template attributes for use with the Document Creation operations and the Document
1554 object. All of the definitions of the Document Template attributes are done by reference to the corresponding Job
1555 Template attributes in other specifications. However, the semantics of each Document Template attribute only
1556 applies to the Document object with which the attribute is associated either by being supplied by the client in the
1557 Document Creation operation or supplied by the Printer as a default because the client did not (and the PDL did not
1558 have any corresponding instruction). See section 5 for defaulting semantics.

1559 **8 Job Description and Document Description attributes**

1560 Table 9 lists all the Job Description defined in other IPP specifications and the corresponding Document Description
1561 attributes defined in this IPP specification. Job Description and Document Description attributes are Job object and
1562 Document object attributes, respectively, that are filled in by the Printer. Some Job/Document Description attribute
1563 values are supplied by the client in the Job/Document Creation operation using corresponding Operation attributes
1564 as flagged with "***". Unless specified otherwise herein, the Printer MUST NOT support modification of Job
1565 Description and Document Descriptions attributes.

1566 The column labeled "attribute syntax" indicates the attribute syntax (see [RFC2911] section 4.1). The Printer
1567 conformance is indicated along with the reference to the specification in which the attribute is defined. The
1568 conformance for Document Description attributes (if the Printer supports the Document object) is the same as the
1569 corresponding Job Description attributes.

1570 [Each of the Document Description attributes have a sub-section in section 8.2. The column labeled References](#)
 1571 [column contains references to the sub-section in this document if there is significant information there. Those](#)
 1572 [subsections that are only references to other specifications contain only that reference in the Reference column.](#)

1573 Note: There are no corresponding Page Range (or Page Override) Description attributes. The Page Range is not an
 1574 object with a state and it cannot be queried.

1575 Legend:

- 1576 **[job-]** indicates an attribute that shouldn't have had a "job-" prefix in its name in [RFC2911], so that the same
 1577 attribute name could also be used for the Document object as a Document Description attribute. Note: For
 1578 the PWG Semantic Model, the "job-" prefix is dropped.
- 1579 "-" indicates that the Job or Document attribute is *not* defined.
- 1580 ****** indicates a Job and/or Document Description attribute that the client MAY supply the values for in a
 1581 corresponding Operation attribute. See Table 6 for the corresponding operation attribute.
- 1582 (r/w) indicates that the Job Description or Document Description attribute is read/write, so that the client can
 1583 changes its value using the Set-Job-Attributes or Set-Document-Attributes operation (see section 3.7).

Table 9 - Job and Document Description attributes

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
attributes-charset **	charset	y	y	MUST	[RFC2911] §4.3.19	§8.2.1
attributes-natural-language **	naturalLanguage	y	y	MUST	[RFC2911] §4.3.20	§8.2.2
compression **	type3 keyword	-y	y	MUST	[RFC2911] §3.2.1.1	§8.2.3
current-page-order	type2 keyword	y	y	MAY	[prod-print] §4.1	§8.2.4
date-time-at-completed	dateTime	y	y	MAY	[RFC2911] §4.3.14.7	§8.2.5
date-time-at-creation	dateTime	y	y	MAY	[RFC2911] §4.3.14.5	§8.2.6
date-time-at-processing	dateTime	y	y	MAY	[RFC2911] §4.3.14.6	§8.2.7
document-format **	documentFormat mime eMediaType	-y	y	MUST	[RFC2911] §3.2.1.1	§8.2.8
document-format-detail	collection	-	y	MAY		§8.2.9
document-format-detected	mimeMediaType	-	y	MAY		§8.2.10
document-id-uri	uri	-	y	MUST		§8.2.11
document-message (r/w)	text(127 MAX)	- ³²	y	MAY		§8.2.12
document-name (r/w) **	name(MAX)	-y	y	MUST	[RFC2911] §3.2.1.1	§8.2.13
document-natural-language **	naturalLanguage	-y	y	MAY	[RFC2911] §3.2.1.1	§8.2.14
document-number	integer(0:MAX)	-	y	MUST		§8.2.15
document-printer-up-time	integer(1:MAX)	-	y	MUST		§8-6
document-state	type1 enum	-	y	MUST		§8.2.16
document-state-message	text(MAX)	-	y	MAY		§8.2.17
document-state-reasons	1setOf type2 keyword	-	y	MUST		§8.2.18
document-uri **	uri	-	y	MAY		§8.2.19
impressions-completed-current-copy	integer(0:MAX)	y	y	MAY	[job-prog] §4.4	§8.2.20
ipp-attribute-fidelity	boolean	y	-y	MUST	[RFC2911] §3.2.1.1	§8.1.1
job-collation-type	type2 enum	y	-	MAY	[job-prog] §4.1	
[job-]detailed-status-message	1setOf text (MAX)	y	y	MAY	[RFC2911] §4.3.10	§8.2.21
[job-]document-access-errors	1setOf text(MAX)	y	y	MAY	[RFC2911] §4.3.11	§8.2.22

³² The "document-message" (text(127)) Document Description attribute has a corresponding "job-message-from-operator" (text(127)) Job Description attribute (see [RFC2911] section 4.3.16) which handles operator to user communication only and a "job-message-to-operator" (text(MAX)) Job Template attribute (see [prod-print] section 3.10) for user to operator communication.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
job-id	integer(1:MAX)	y	-y	MUST	[RFC2911] §4.3.2	§8.2.23
[job-]impressions **	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.17.2	§8.2.24
[job-]impressions-completed	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.18.2	§8.2.25
[job-]k-octets **	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.17.1	§8.2.26
[job-]k-octets-processed	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.18.1	§8.2.27
job-mandatory-attributes	1setOf type2 keyword	y	-	MAY		§8.1.2
[job-]media-sheets **	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.17.3	§8.2.28
[job-]media-sheets-completed	integer(0:MAX)	y	y	MAY	[RFC2911] §4.3.18.3	§8.2.29
job-message-from-operator	text(127)	y	- ³³	MAY	[RFC2911] §4.3.16	
[job-]more-info	uri	y	y	MAY	[RFC2911] §4.3.4	§8.2.30
job-name (r/w)	name(MAX)	y	- ³⁴	MUST	[RFC2911] §4.3.5	
job-originating-user-name	name (MAX)	y	-	MUST	[RFC2911] §4.3.6	
job-password	octetString(255)	y ³⁵		MAY	[prod-print2] §4.1	
job-password-encryption	type3 keyword name(MAX)	y ³⁶		MAY	[prod-print2] §4.2	
job-printer-make-and-model	text(127)	y	-	CMUST ³⁷	[RFC2911] §4.3.14.4	
[job-]printer-up-time	integer (1:MAX)	y	y	MUST	[RFC2911] §4.3.14.4	§8.2.31
job-printer-uri	uri	y	y-	MUST	[RFC2911] §4.3.3	§8.2.32
job-state	type1 enum	y	- ³⁸	MUST	[RFC2911] §4.3.7	§8.2.16
job-state-message	text(MAX)	y	- ³⁹	MAY	[RFC2911] §4.3.9	§8.2.17
job-state-reasons	1setOf type2 keyword	y	- ⁴⁰	MUST	[RFC2911] §4.3.8	§8.2.18
job-uri	uri	y	-y ⁴¹	MUST	[RFC2911] §4.3.1	§8.2.33

³³ The “job-message-from-operator” Job Description attribute has no corresponding “document-message-from-operator” (text(127)) Document Description attribute. Instead, both the user and the operator use the “document-message” (text(127)) operation/Document Description attribute (see section **Error! Reference source not found.**) to communicate with each other.

³⁴ The Document Description attribute that corresponds to the “job-name” Job Description attribute is the (existing) “document-name” attribute defined in [RFC2911].

³⁵ **ISSUE 08: Need to add “job-password” to [prod-print2] as a Job Description attribute to go along with the Operation attribute with suitable security in Get-Job-Attributes response in order to align with the PWG Semantic Model, OK?**

³⁶ **ISSUE 09: Need to add “job-password-encryption” to [prod-print2] as a Job Description attribute to go along with the Operation attribute with suitable security in Get-Job-Attributes response in order to align with the PWG Semantic Model, OK?**

³⁷ The “job-printer-make-and-model” Job Description attribute MUST be supported if the “job-save-disposition” Job Template attribute is supported.

³⁸ The Document Description attribute that corresponds to the “job-state” Job Description attribute is the (new) “document-state” attribute.

³⁹ The Document Description attribute that corresponds to the “job-state-message” Job Description attribute is the (new) “document-state-message” attribute.

⁴⁰ The Document Description attribute that corresponds to the “job-state-reasons” Job Description attribute is the (new) “document-state-reasons” attribute.

⁴¹ The “job-uri” Document Description attribute is a copy of the “job-uri” Job Description attribute of the job that contains this Document. that corresponds to the “job-uri” (uri) Job Description attribute is the (new) “document-id-uri” (uri) attribute. However, the value is only a unique ID. The client cannot use the “document-id-uri” attribute URI value as a target of a Document object operation; the “job-uri” has proved problematic enough as a target.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax	Job	Doc	Printer conform- ance	Reference	
					Job Description Attr	Doc Desc.
[job-warnings-count	integer(0:MAX)	y	y	MAY	[override] §6.1	§8.2.34
last-document **	boolean	-	y	MAY	[RFC2911] §4.3.12	§8.2.35
number-of-documents	integer(0:MAX)	y	-	MAY	[RFC2911] §4.3.15	
number-of-intervening-jobs	integer(0:MAX)	y	-	MAY	[RFC2911] §4.3.13	
output-device-assigned	name(127)	y	y-	MAY	[RFC2911] §4.3.7.2	§8.2.36
sheet-completed-copy-number	integer(0:MAX)	y	y	MAY	[job-prog] §4.2	§8.2.37
sheet-completed-document-number	integer(0:MAX)	y	-	MAY	[job-prog] §4.3	
time-at-completed	integer (MIN:MAX)	y	y	MUST	[RFC2911] §4.3.14.3	§8.2.38
time-at-creation	integer (MIN:MAX)	y	y	MUST	[RFC2911] §4.3.14.1	§8.2.39
time-at-processing	integer (MIN:MAX)	y	y	MUST	[RFC2911] §4.3.14.2	§8.2.40

1585 “**” See the description in the Legend before the table.
1586

1587 Most of the existing “job-state” and “job-state-reasons” Job Description attribute values apply equally well to
1588 individual documents in a multi-document job (with removal of the ‘job-’ prefix for those that apply to both Job and
1589 Document). Furthermore, the job states are completely service-type neutral, so they can apply to scanning, faxing,
1590 formatting processes as well. The job state reasons have a number of reasons that are print service specific, but
1591 most can apply to other types of service as well. The reason for separating state from reasons, is so that the states
1592 can be the fundamental states that most implementations have, while the state reasons can vary depending on the
1593 sophistication of the system. The states are the ones that clients are most likely to base actions upon, and the state
1594 reasons are more information, both for programs and people.

1595 The descriptions of the new “document-state” and “document-state-reasons” attributes are merged in with the
1596 existing “job-state” and “job-state-reasons”. Such merging shows the parallelism in the description to aid
1597 understanding and implementation and so that future maintenance will continue this strong parallelism. The “/”
1598 character separates the words: Job from Document so that the same description can serve for both Job and
1599 Document objects.

1600 **8.1 Job Description attributes**

1601 This section contains *only* the Job Description attributes that are defined in this specification and are not defined in
1602 any other specification.

1603 **8.1.1 ipp-attribute-fidelity (boolean)**

1604 This REQUIRED Job Description attribute indicates the value of the corresponding “ipp-attribute-fidelity” operation
1605 attribute that the client supplied in the Job Creation operation. This Job Description attribute has no effect on the
1606 processing of the job once the Job Creation and Document Creation operations have been accepted. However, this
1607 attribute does provide an audit capability to the user and service desk for comparing unexpected printed results with
1608 what was submitted.

1609 **8.1.2 job-mandatory-attributes (1setOf type2 keyword)**

1610 This OPTIONAL Job Description attribute indicates which Job Template and Document Template attributes the client
1611 required that the Printer honor in order to accept the Job Creation and subsequent Document Creation requests.
1612 The Printer populates this attribute with the value of the corresponding “job-mandatory-attributes” operation attribute
1613 (see section 4.3.2) supplied by the client in the Job Creation operation. This Job Description attribute has no effect
1614 on the processing of the job once the Job Creation and Document Creation operations have been accepted.

1615 However, this attribute does provide an audit capability to the user and service desk for comparing unexpected
1616 printed results with what was submitted.

1617 **8.2 Document Description attributes**

1618 This section contains all of the Document Description attributes for use with the Document object. Most of these
1619 definitions refer to the corresponding Job Template attribute semantics in other specifications. However, the
1620 semantics of each Document Description attribute only applies to the Document object containing the Document
1621 Description attribute.

Important Implementer's note: The brief descriptions in this section are not a substitute for the detailed specification in the referenced specifications. You need to read the referenced specifications when implementing!

1622 **8.2.1 attributes-charset (charset)**

1623 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1624 attribute (see [RFC2911] §4.3.19) applied to the Document object. The Printer sets this Document Description
1625 attribute from the corresponding operation attribute supplied by the client in the Document Creation operation (see
1626 section 3.1).

1627 **8.2.2 attributes-natural-language (naturalLanguage)**

1628 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
1629 attribute (see [RFC2911] §4.3.20) applied to the Document object. The Printer sets this Document Description
1630 attribute from the corresponding operation attribute supplied by the client in the Document Creation operation (see
1631 section 3.1).

1632 **8.2.3 compression (type3 keyword)**

1633 This REQUIRED Document Description attribute specifies the compression used to represent this document (see
1634 [RFC2911] §3.2.1.1). The Printer sets this Document Description attribute from the corresponding operation attribute
1635 supplied by the client in the Document Creation operation (see section 3.1).

1636 **8.2.4 current-page-order (type2 keyword)**

1637 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1638 attribute (see [prod-print] §4.1) applied to the Document object.

1639 **8.2.5 date-time-at-completed (dateTime)**

1640 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1641 attribute (see [RFC2911] §4.3.14.7) applied to the Document object.

1642 **8.2.6 date-time-at-creation (dateTime)**

1643 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
1644 attribute (see [RFC2911] §4.3.14.5) applied to the Document object.

1645 **8.2.7 date-time-at-processing (dateTime)**

1646 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
 1647 attribute (see [RFC2911] §4.3.14.6) applied to the Document object.

1648 **8.2.8 document-format (mimeMediaType)**

1649 This REQUIRED Document Description attribute specifies the document format (see [RFC2911] §3.2.1.1) for the
 1650 Document object. The Printer sets this Document Description attribute from the corresponding operation attribute
 1651 supplied by the client in the Document Creation operation (see section 3.1).

1652 **8.2.9 document-format-detail (collection)**

1653 **ISSUE 04: Is the definition of "document-format-detail" OK?**

1654 This OPTIONAL Document Description attribute provides additional information about the document format or
 1655 document formats in the Document object. The member attributes of the "document-format-detail" attribute are:

1656 **Table 10 - "document-format-detail" member attributes**

<u>Member Attribute Name</u>	<u>Attribute Syntax</u>	<u>Present</u>	<u>Printer Support</u>
<u>document-format</u>	<u>mimeMediaType</u>	<u>MUST</u>	<u>MUST</u>
<u>document-format-version</u>	<u>text(127)</u>	<u>MAY</u>	<u>MUST</u>
<u>document-format-natural-languages</u>	<u>1setOf naturalLanguage</u>	<u>MAY</u>	<u>MUST</u>
<u>platform</u>	<u>type3 keyword name(MAX)</u>	<u>MAY</u>	<u>MUST</u>
<u>device-id</u>	<u>text(127)</u>	<u>MAY</u>	<u>MUST</u>
<u>document-format-details</u>	<u>1setOf collection</u>	<u>MAY</u>	<u>MUST - If the Printer support</u> <u>a format that contains other</u> <u>document formats</u>

1657

1658 **8.2.9.1 document-format (mimeMediaType)**

1659 This REQUIRED member attribute contains the MIME Media Type of the top level document content. The
 1660 standard values for this attribute are Internet Media types (sometimes called MIME types). For further details
 1661 see the description of the 'mimeMediaType' attribute syntax in [RFC2911] section 4.1.9.

1662 If it is a MIME Media Type, such as 'multipart/related' or 'application/zip', that is a container format that
 1663 contains document parts, the "document-format-details" member attribute described each part.

1664 **8.2.9.2 document-format-version (text(127))**

1665 This REQUIRED member attribute contains the level or version of the document format. For example, the
 1666 value for PostScript level 3 would be: "3" and for PCL 5e would be '5e'.

1667 **8.2.9.3 document-format-natural-languages (1setOf naturalLanguage)**

1668 This REQUIRED member attribute contains the natural language(s) of the document. The Printer MAY use
 1669 this value to select fonts or other Globalization processing.

1670 **8.2.9.4 platform (type3 keyword | name(MAX))**

1671 **ISSUE 05:** Should we call this member attribute “os-type”, instead of “platform”, in order to agree with the
1672 PWG Printer Installation Extension (see draft-ietf-ipp-install-04.txt)?

1673 This REQUIRED member attribute identifies the operating system type the of platform on which the
1674 document was generated. Valid values are the operating system names defined in the IANA document [os-
1675 names] and the special keyword value: ‘unknown’. Although the IANA registry requires that the names be all
1676 upper-case, the values MUST be all lower case in this field since they are IPP keywords (plus hyphen-minus
1677 (-), period (.), and slash (/)). Examples: ‘linux’, ‘linux-2.2’, ‘os/2’, ‘mac’, ‘mac-x’, ‘sun-os-4.0’, ‘unix’, ‘unix-
1678 BSD’, ‘win32’, ‘windows-95’, ‘windows-98’, ‘windows-ce’, ‘windows-nt’, ‘windows-nt-4’, ‘windows-nt-5’,
1679 ‘windows-2000’, and ‘unknown’.

1680 **8.2.9.5 device-id (text(127))**

1681 This REQUIRED member attribute identifies the type of device for which the document was formatted,
1682 including manufacturer and model. The value of this variable MUST exactly match the IEEE 1284-2000
1683 Device ID string, except the length field MUST not be specified. See the Microsoft Universal Plug and Play
1684 [upnp] section 2.2.6 DeviceId parameter for details and examples.

1685 **8.2.9.6 document-format-details (1setOf collection)**

1686 This member attribute identifies the document format details of the body parts, if the top level document
1687 format is a container types, such as ‘multipart/related’ or ‘application/zip’. The Printer MUST support this
1688 member attribute if it supports a container MIME type.

1689 The member attributes defined for this collection are the same as those defined for “document-format-detail”
1690 itself, i.e., a recursive definition. But there MUST NOT be any duplicate collection values at the same level;
1691 its a set, not a sequence. So 100 PostScript files with the same details in a .zip file would have
1692 ‘application/zip’ as the top level MIME type with its details and only one value of the “document-format-
1693 details” member attribute with PostScript details.

1694 **8.2.10 document-format-detected (mimeMediaType)**

1695 This OPTIONAL Document Description attribute is generated by the Printer to indicate the actual document format of
1696 the Document object. This value will differ from the value submitted by the client or defaulted by the Printer, if the
1697 Printer automatically senses the document format by examining the document content, such as when the “document-
1698 format” attribute has the value: ‘application/octet-stream’ (see [RFC2911] section 4.1.9.1). Before the document
1699 format is known, the Printer populates this attribute with a zero length string.

1700 **8.2.11 document-id-uri (uri)**

1701 This REQUIRED Document Description attribute is generated by the Printer as a unique URI to identify a Document
1702 object, in the same way that the “job-uri” (uri) Job Description attribute uniquely identifies a Job object. Unlike the
1703 “job-uri” (uri) attribute, the client cannot supply this attribute as a target of an operation.

1704 **8.2.12 document-mandatory-attributes (1setOf type2 keyword)**

1705 This OPTIONAL Document description attribute indicates which Document Template attributes the client required
1706 that the Printer honor in order to accept the Document Creation request. The Printer populated this attribute with the
1707 value of the corresponding “document-mandatory-attributes” operation attribute (see section ???) supplied by the
1708 client in the Document Creation operation. After the Document Creation operation completes, this attribute has no
1709 affect on the behavior of the job (see section 3.1.2). However, this attribute does provide an audit capability to the

1710 ~~user and service desk for trouble shooting unexpected results. See section §8.1.1 for the “job-mandatory-attributes”~~
 1711 ~~Job-Description attribute that affects Job-Creation requests.~~

1712 **8-128.2.12 document-message (text(127MAX))**

1713 ~~ISSUE 02: Should the “document-message” Document-Description attribute have a maximum of 127 octets, like the~~
 1714 ~~“job-message-from-operator” (text(127)) Job-Description attribute in [RFC2911] section 4.3.16 or MAX (1023 octets)~~
 1715 ~~like “job-message-to-operator” (text(MAX)) Job-Template attribute in IEEE-ISTO 5100.3 [prod-print] section 3.10?~~
 1716 ~~MAX is better – New Orleans~~

1717 This OPTIONAL Document-Description contains a message from the user to the operator or a message from the
 1718 operator or administrator system administrator or “intelligent” process to indicate to the end user the reasons for
 1719 modification or other management action taken on the Document. The Printer populates this Document-Description
 1720 attribute from the “document-message” (text(127MAX)) operation attribute value supplied by the client in any of the
 1721 Document-Creation operations (see section 3.1.1) or in a Cancel-Document ~~or Cancel-Current-Document~~ operations
 1722 (see sections 3.8 ~~or 4.4~~).

1723 In addition, the user and the operator can set the value of this Document-Description attribute explicitly using the Set-
 1724 Document-Attributes operation (see section 3.7).

1725 **8.2.13 document-name (name(MAX))**

1726 This REQUIRED Document-Description attribute specifies the name of the document (see [RFC2911] §3.2.1.1).
 1727 The Printer sets this Document-Description attribute from the corresponding operation attribute supplied by the client
 1728 in the Document-Creation operation (see section 3.1).

1729 This attribute may be modified by a client using the Set-Document-Attributes operation (see section 3.7).

1730 **8.2.14 document-natural-language (naturalLanguage)**

1731 This OPTIONAL Document-Description attribute specified the natural language of the document (see [RFC2911]
 1732 §3.2.1.1). The Printer sets this Document-Description attribute from the corresponding operation attribute supplied
 1733 by the client in the Document-Creation operation (see section 3.1).

1734 **8-158.2.15 document-number (integer(01:MAX))**

1735 This REQUIRED Document-Description attribute is the ordinal number of the document within the job which
 1736 determines its order of being printed in a multi-document job. The Printer **MUST** generate the values monotonically
 1737 increasing from 1 for ~~a the~~ each job. ~~However, the client MAY supply the value in the “input-document-number”~~
 1738 ~~operation attribute (see section 3.1.1.1).~~

1739 **8-168.2.16 document-state (type1 enum) and job-state (type1 enum)**

1740 The REQUIRED “job-state” and the REQUIRED “document-state” attribute identify the current state of the job and
 1741 document, respectively. Even though IPP defines seven values for job/document states (plus the out-of-band
 1742 'unknown' value - see [RFC2911] section 4.1), implementations only need to support those states which are
 1743 appropriate for the particular implementation. In other words, an IPP Printer object implementation supports only
 1744 those job/document states implemented by the output device and available to the IPP Printer object implementation.

1745 Table 11 lists the “job-state” and “document-state” attribute values.

1746

Table 11 - "job-state" and "document-state" attribute values

Values	"job-state"	"document-state"
3 pending	y	y
4 pending-held	y	n/a
5 processing	y	y
6 processing-stopped	y	n/a
7 canceled	y	y
8 aborted	y	y
9 completed	y	y

1747

1748 The (JD) and (J) notation below indicates whether the keyword is defined for the "job-state" and "document-state"
 1749 attributes or just the "job-state" attribute as indicated in Table 11. Standard enum values are:

Value	Symbolic Name and Description
'3'	'pending' (JD): The job is a candidate to start processing, but is not yet processing. The document has not started to be processed at all.
'4'	'pending-held' (J): The job is not a candidate for processing for any number of reasons but will return to the 'pending' state as soon as the reasons are no longer present. The job's "job-state-reason" attribute MUST indicate why the job is no longer a candidate for processing. The 'pending-held' state does not apply to the Document object's "document-state" attribute.
'5'	'processing' (JD): One or more of: <ol style="list-style-type: none"> 1. The job is using, or is attempting to use, one or more purely software processes that are analyzing, creating, or interpreting a PDL, etc., 2. The job is using, or is attempting to use, one or more hardware devices that are interpreting a PDL, making marks on a medium, and/or performing finishing, such as stapling, etc., 3. The Printer object has made the job ready for printing, but the output device is not yet printing it, either because the job hasn't reached the output device or because the job is queued in the output device or some other spooler, awaiting the output device to print it. <p>When the job is in the 'processing' state, the entire job/document state includes the detailed status represented in the Printer object's "printer-state", "printer-state-reasons", and "printer-state-message" attributes.</p> <p>On the other hand, the 'processing' state for the Document indicates that the Document has begun to be processed. Even if the job stops being processed, the Document remains in the 'processing' state until it moves to one of the three terminal states.</p> <p>Implementations MAY, though they NEED NOT, include additional values in the job's/document's "job-state-reasons"/"document-state-reasons" attribute to indicate the progress of the job/document, such as adding the 'job-printing'/'printing' value to indicate when the output device is actually making marks on paper and/or the 'processing-to-stop-point' value to indicate that the Printer is in the process of canceling or aborting the job/document. Most implementations won't bother with this nuance.</p>
'6'	'processing-stopped' (J): The job has stopped while processing for any number of reasons and will return to the 'processing' state as soon as the reasons are no longer present.

Value	Symbolic Name and Description
'7'	<p>The job's "job-state-reason" attribute MAY indicate why the job has stopped processing. For example, if the output device is stopped, the 'printer-stopped' value MAY be included in the job's "job-state-reasons" attribute.</p> <p>Note: When an output device is stopped, the device usually indicates its condition in human readable form locally at the device. A client can obtain more complete device status remotely by querying the Printer object's "printer-state", "printer-state-reasons" and "printer-state-message" attributes.</p> <p>The 'processing-stopped' state does not apply to the Document object's "document-state" attribute.</p> <p>'canceled' (JD): The job/document has been canceled by a Cancel-Job/Cancel-Documents operation and the Printer object has completed canceling the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer object is canceling the job/document, the job/document remains in its current state, but the job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' value and one of the 'canceled-by-user', 'canceled-by-operator', or 'canceled-at-device' value. When the job/document moves to the 'canceled' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'canceled-by-xxx', if present, MUST remain.</p>
'8'	<p>'aborted' (JD): The job/document has been aborted by the system, usually while the job/document was in the 'processing' or 'processing-stopped' state and the Printer has completed aborting the job/document and all job/document status attributes have reached their final values for the job/document. While the Printer object is aborting the job/document, the job/document remains in its current state, but the job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain the 'processing-to-stop-point' and 'aborted-by-system' values. When the job/document moves to the 'aborted' state, the 'processing-to-stop-point' value, if present, MUST be removed, but the 'aborted-by-system' value, if present, MUST remain.</p>
'9'	<p>'completed' (JD): The job/document has completed successfully or with warnings or errors after processing and all of the job/document media sheets have been successfully stacked in the appropriate output bin(s) and all job/document status attributes have reached their final values for the job/document. The job's/document's "job-state-reasons"/"document-state-reasons" attribute SHOULD contain one of: 'completed-successfully', 'completed-with-warnings', or 'completed-with-errors' values.</p>

1750 The final value for this attribute MUST be one of: 'completed', 'canceled', or 'aborted' before the Printer removes the
 1751 job/document altogether. The length of time that jobs/document remain in the 'canceled', 'aborted', and 'completed'
 1752 states depends on implementation.

1753 Jobs/documents reach one of the three terminal states: 'completed', 'canceled', or 'aborted', after the jobs/documents
 1754 have completed all activity, including stacking output media, after the jobs/documents have completed all activity,
 1755 and all job/document status attributes have reached their final values for the job/document.

1756 **8.46.18.2.16.1 The "job-state" Job Description attribute and the Job Life Cycle**

1757 The "job-state" attribute is one of the most important Job Description attributes. Figure 1 shows the values of the
 1758 "job-state" attribute and the Job object life cycle as affected by actions on the Job, Printer, and job processing.

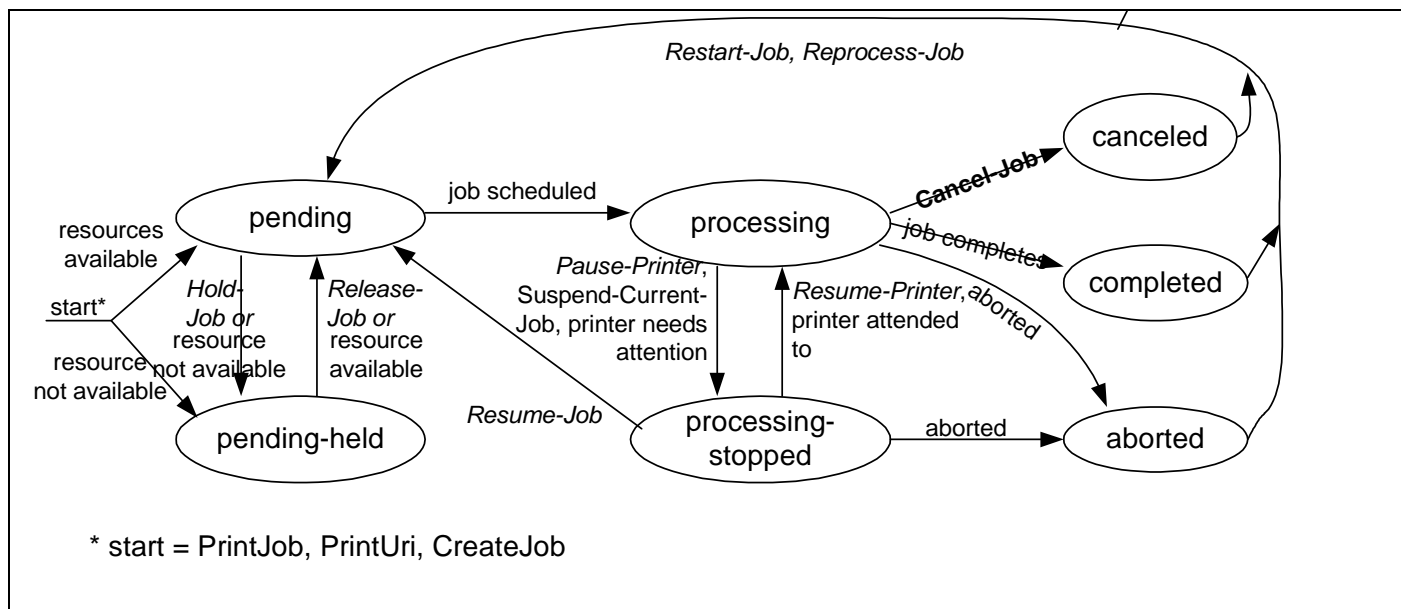


Figure 1 - The “job-state” Job Description attribute and the Job object life cycle

Normally a job progresses from left to right. Other state transitions are unlikely, but are not forbidden. Not shown are the transitions to the 'canceled' state from the 'pending', 'pending-held', and 'processing-stopped' states.

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

The “document-state” attribute is one of the most important Document Description attributes. Figure 2 shows the values of the “document-state” attribute and the Document object life cycle as affected by actions on the Job, Document, Printer, and job processing. Documents are not active objects and their life cycle is closely tied to the lifecycle of a Job⁴². Documents basically have three states. The first is waiting to be processed by a Job (i.e. pending). The second state is from the time the Job first starts processing the Document (i.e., processing) and until it reaches one of its terminal states. The third state for a Document is one of its terminal states (i.e., completed, canceled, or aborted).

⁴² The Document object is not really a sub-job. If the Document object were its own independent active object, i.e., were a sub-job, then the Document state would affect the job state and there would be complex and debatable roll-up rules for how the various “document-state” values of all of the Job’s document are rolled up to give a single value for the Job’s “job-state” attribute. Instead, the Job state reflects the overall processing of the job and is the same whether or not the Document object is supported.

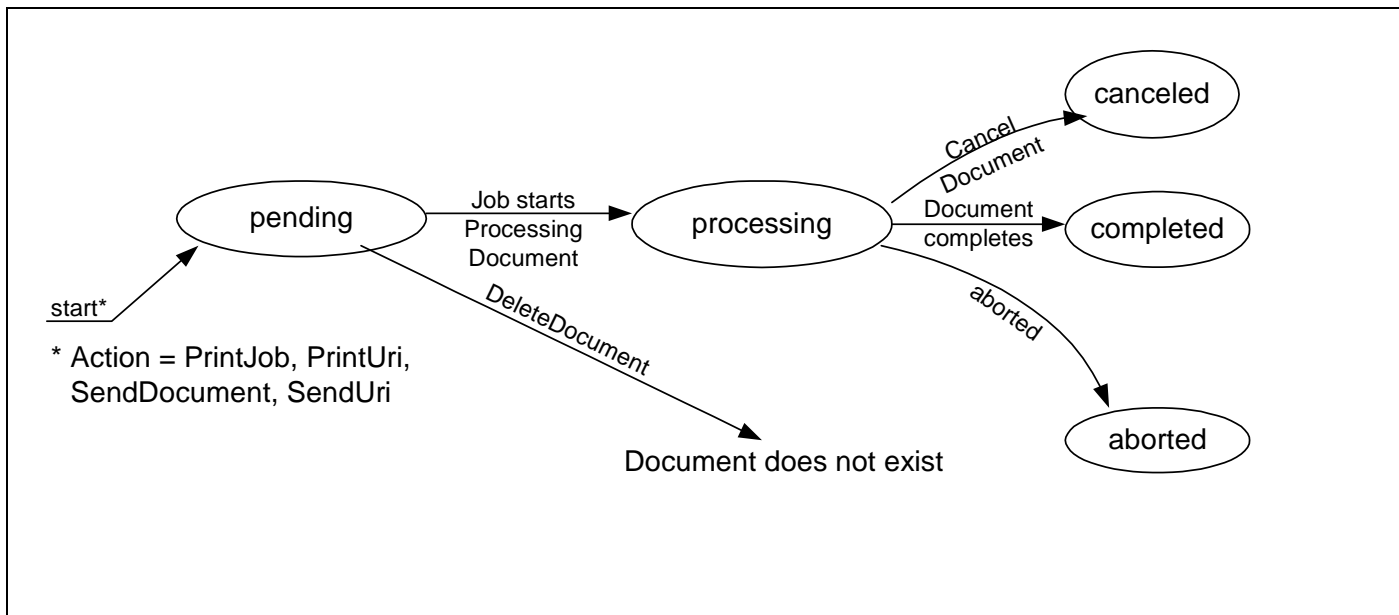


Figure 2 - The “document-state” Document Description attribute and the Document object life Cycle

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

8.2.16.3 Forwarding Servers

As with all other IPP attributes, if the implementation can not determine the correct value for this attribute, it SHOULD respond with the out-of-band value 'unknown' (see [RFC2911] Section 4.1) rather than try to guess at some possibly incorrect value and give the end user the wrong impression about the state of the Job/Document object. For example, if the implementation is just a gateway into some printing system from which it can normally get status, but temporarily is unable, then the implementation should return the 'unknown' value. However, if the implementation is a gateway to a printing system that never provides detailed status about the print job/document, the implementation MAY set the IPP Job/Document object's state to 'completed', provided that it also sets the 'queued-in-device' value in the job's/document's "job-state-reasons"/"document-state-reasons" attribute (see "job-state-reasons"/"document-state-reasons" attribute below).

8.2.16.4 Partitioning of Job/Document States

This section partitions the job/document states into phases: Job/Document Not Completed, Job/Document Retention, Job/Document History, and Job/Document Removal. This section also explains the 'job-restartable' value of the "job-state-reasons" Job Description attribute for use with the Restart-Job operation.

Job/Document Not Completed: When a job is in the 'pending', 'pending-held', 'processing', or 'processing-stopped' states, the job is not completed. When a Document is in the 'pending' or 'processing' state, it is not completed.

Job Retention: When a job enters one of the three terminal job states: 'completed', 'canceled', or 'aborted', the IPP Printer object MAY "retain" the job in a restartable condition for an implementation-defined time period. This time period MAY be zero seconds and MAY depend on the terminal job state. This phase is called Job Retention. While in the Job Retention phase, the job's document data is retained and a client may restart the job using the Restart-Job operation. If the Printer supports the Restart-Job operation, then it SHOULD indicate that the job is restartable by adding the 'job-restartable' value to the job's "job-state-reasons" attribute (see section 8.2.18) during the Job Retention phase. If the Printer supports the Document object, then the Get-Document-Attributes and Get-Documents operations MUST be supported while the job is in the Job Retention phase.

1801 **Job History:** After the Job Retention phase expires for a job, the Printer object deletes the document data for the
1802 job and the job becomes part of the Job History. The Printer object MAY also delete any number of the job and
1803 document attributes. Since the job is no longer restartable, the Printer object MUST remove the 'job-restartable'
1804 value from the job's "job-state-reasons" attribute, if present. If the implementation supports the Document object, it
1805 SHOULD retain at least the "document-state" and "document-state-reasons" attributes on the Document object
1806 during the Job History phase which can be queried using the Get-Document-Attributes and Get-Documents
1807 operations.

1808 **Job Removal:** After the job has remained in the Job History for an implementation-defined time, such as when the
1809 number of jobs exceeds a fixed number or after a fixed time period (which MAY be zero seconds), the IPP Printer
1810 removes the Job and Document objects from the system.

1811 Using the Get-Jobs/Get-Documents operation and supplying the 'not-completed' value for the "which-jobs" operation
1812 attribute, a client is requesting jobs/documents in the Job/Document Not Completed phase. Using the Get-Jobs/Get-
1813 Documents operation and supplying the 'completed' value for the "which-jobs" operation attribute, a client is
1814 requesting jobs/documents in the Job Retention and Job History phases. Using the Get-Job-Attributes/Get-
1815 Document-Attributes operation, a client is requesting a job/documents in any phase except Job Removal. After Job
1816 Removal, the Get-Job-Attributes/Get-Documents-Attributes and Get-Jobs/Get-Documents operations no longer are
1817 capable of returning any information about a job/document.

1818 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

1819 **8.178.2.17 document-state-message (text(MAX)) and job-state-message (text(MAX))**

1820 This OPTIONAL attribute specifies information about the "job-state"/"document-state" and "job-state-
1821 reasons"/"document-state-reasons" attributes in human readable text. If the Printer object supports this attribute, the
1822 Printer object MUST be able to generate this message in any of the natural languages identified by the Printer's
1823 "generated-natural-language-supported" attribute (see the "attributes-natural-language" operation attribute specified
1824 in [RFC2911] Section 3.1.4.1).

1825 The value SHOULD NOT contain additional information not contained in the values of the "job-state" and "job-states-
1826 reasons" attributes, such as interpreter error information. Otherwise, application programs might attempt to parse the
1827 (localized text). For such additional information such as interpreter errors for application program consumption or
1828 specific document access errors, new attributes with keyword values, needs to be developed and registered.

1829 **8.188.2.18 document-state-reasons (1setOf type2 keyword) and job-state-reasons(1setOf** 1830 **type2 keyword)**

1831 The REQUIRED "job-state-reasons" and the REQUIRED "document-state-reasons" attributes provide additional
1832 information about the job's and each document's current state, i.e., information that augments the value of the job's
1833 "job-state" attribute and each Document's "document-state" attribute, respectively. The Printer SHOULD support the
1834 same values for both the "job-state-reasons" and the "document-state-reasons" attribute for those attributes that are
1835 defined for both as indicated in the "Job" and "Doc" columns in Table 12.

1836 These values MAY be used with any job or document state or states for which the reason makes sense. Some of
1837 these value definitions indicate conformance requirements; the rest are OPTIONAL. Furthermore, when
1838 implemented, the Printer MUST return these values when the reason applies and MUST NOT return them when the
1839 reason no longer applies whether the value of the Job's "job-state" attribute or the Document's "document-state"
1840 attribute changed or not. When the Job or Document does not have any reasons for being in its current state, the
1841 value of the Job's "job-state-reasons" attribute or Document's "document-state-reasons" attribute MUST be 'none'.

1842 Some of the Job's "job-state-reasons" values affect job scheduling, such as 'resources-are-not-ready' and 'job-hold-
1843 until-specified'. However, "document-state-reasons" values MUST NOT affect job scheduling, since Document
1844 objects are passive objects operated on by the containing Job object.

1845 Note: While values cannot be added to the "job-state" or "document-state" attributes without impacting deployed
 1846 clients that take actions upon receiving "job-state" or "document-state" values, it is the intent that additional "job-
 1847 state-reasons" and "document-state-reasons" values can be defined and registered without impacting such deployed
 1848 clients. In other words, the "job-state-reasons" and the "document-state-reasons" attributes are intended to be
 1849 extensible.

1850 Table 12 lists the standard keyword values for the "job-state-reasons" and/or "document-state-reasons" attributes
 1851 defined in this and other IPP specifications as indicated in the References column. In Table 12 the keywords are
 1852 listed in alphabetic order (observing the "[job-]" prefix), while in their descriptions following Table 12, they are listed in
 1853 the most likely order of occurrence to help understanding.

1854 When the Document object is supported, the Printer implementation SHOULD still support the corresponding Job
 1855 level "job-state-reasons", so that clients that do not support the Document object will receive the same information.
 1856 Also it is usually more convenient for the client to obtain just the Job level status. However, the client SHOULD
 1857 query both Job and Document attributes and convert them to some canonical form for display to the user, so that all
 1858 Jobs and their Documents are displayed in a uniform manner, no matter from which clients they were submitted.

Notation:

- 1859 [job-] indicates a state reason keyword value that has the 'job-' prefix when it is a value of the "job-state-reasons"
 1860 attribute, but does not have the 'job-' prefix when it is a value of the "document-state-reasons" attribute⁴³.
- 1861 For purposes of sorting in Table 12, the "[job-]" prefix is observed, since this is an IPP specification.
- 1862 "-." indicates that the Job or Document value is *not* defined.

Table 12 - "job-state-reasons" and "document-state-reasons" attribute values

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Job	Doc	Printer conformance	Reference
job-state-reasons	1setOf type2 keyword	y	- ⁴⁴	MUST	[RFC2911] §4.3.8
document-state-reasons	1setOf type2 keyword	-	y	MUST	[this spec] §8.2.18
	aborted-by-system	y	y	MAY	[RFC2911] §4.3.8
	compression-error	y	y	MAY	[RFC2911] §4.3.8
	document-access-error	y	y	MAY	[RFC2911] §4.3.8
	document-format-error	y	y	MAY	[RFC2911] §4.3.8
	[job-]canceled-at-device	y	y	MAY	[RFC2911] §4.3.8
	[job-]canceled-by-operator	y	y	MAY	[RFC2911] §4.3.8
	[job-]canceled-by-user	y	y	MAY	[RFC2911] §4.3.8
	[job-]completed-successfully	y	y	MAY	[RFC2911] §4.3.8
	[job-]completed-with-errors	y	y	MAY	[RFC2911] §4.3.8
	[job-]completed-with-warnings	y	y	MAY	[RFC2911] §4.3.8
	job-data-insufficient	y	-	MAY	[RFC2911] §4.3.8
	job-hold-until-specified	y	-	MAY	[RFC2911] §4.3.8
	[job-]incoming	y	y	MAY	[RFC2911] §4.3.8
	[job-]interpreting	y	y	MAY	[RFC2911] §4.3.8
	[job-]outgoing	y	y	MAY	[RFC2911] §4.3.8
	job-password-wait	y	-	MAY	[prod-print2] §8.3.1
	[job-]printing	y	y	MAY	[RFC2911] §4.3.8
	[job-]queued	y	y	MAY	[RFC2911] §4.3.8
	[job-]queued-for-marker	y	y	MAY	[RFC2911] §4.3.8

⁴³ For the PWG Semantic Model [pwg-sm], the "job-" prefix is being dropped altogether so that the same values can be used for both the JobStateReasons and DocumentStateReasons attributes.

⁴⁴ The Document Description attribute that corresponds to the "job-state-reasons" Job Description attribute is the (new) "document-state-reasons" attribute.

IPP Job Description / Document Description attribute name	IPP Attribute Syntax plus Values	Job	Doc	Printer conformance	Reference
	job-restartable	y	-	MAY	[RFC2911] §4.3.8
	job-resuming	y	-	MAY	[prod-print2] §8.3.1
	job-saved-successfully	y	-	MAY	[prod-print2] §8.3.1
	job-save-error	y	-	MAY	[prod-print2] §8.3.1
	job-saving	y	-	MAY	[prod-print2] §8.3.1
	job-scheduling	y	-	MAY	[prod-print2] §8.3.1
	[job-]spooling	y	y	MAY	[prod-print2] §8.3.1
	[job-]streaming	y	y	MAY	[prod-print2] §8.3.1
	job-suspended	y	-	MAY	[adm-ops] §9.1
	job-suspended-by-operator	y	-	MAY	[prod-print2] §8.3.1
	job-suspended-by-system	y	-	MAY	[prod-print2] §8.3.1
	job-suspended-by-user	y	-	MAY	[prod-print2] §8.3.1
	job-suspending	y	-	MAY	[prod-print2] §8.3.1
	[job-]transforming	y	y	MAY	[RFC2911] §4.3.8
	[job-]warnings-detected	y	y	MAY	[override] §7.1
	none	y	y	MUST	[RFC2911] §4.3.8
	printer-stopped	y	-	MAY	[RFC2911] §4.3.8
	printer-stopped-partly	y	-	MAY	[RFC2911] §4.3.8
	processing-to-stop-point	y	-	MAY	[RFC2911] §4.3.8
	proof-print-wait	y	-	MAY	[prod-print2] §8.3.1
	queued-in-device	y	y	MAY	[RFC2911] §4.3.8
	resources-are-not-ready	y	-	MAY	[RFC2911] §4.3.8
	resources-are-not-supported	y	y	MAY	[prod-print] §6.1
	service-off-line	y	-	MAY	[RFC2911] §4.3.8
	submission-interrupted	y	y	MAY	[RFC2911] §4.3.8
	unsupported-compression	y	y	MUST	[RFC2911] §4.3.8
	unsupported-document-format	y	y	MUST	[RFC2911] §4.3.8

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For ease of understanding, the following value descriptions are presented in the order in which the reasons are likely to occur (if implemented), starting with the 'none' value. Note: The order is improved over that in [RFC2911]. The (JD), (J), and (D) notation is identical to the "Job" and "Doc" columns in Table 12 indicating whether the keyword is defined for the "job-state-reasons" and/or "document-state-reasons" attributes:

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'none' (JD): There are no reasons for the job's or document's current state. This state reason is semantically equivalent to "job-state-reasons" or "document-state-reasons" attribute without any value and MUST be used when there is no other value, since the 1setOf attribute syntax requires at least one value.

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'job-hold-until-specified' (J): The value of the job's "job-hold-until" attribute was specified with a time period that is still in the future. The job MUST NOT be a candidate for processing until this reason is removed and there are no other reasons to hold the job. This value SHOULD be supported if the "job-hold-until" Job Template attribute is supported.

1878

1879

1880

'job-password-wait' (J): The Job is currently being held until the correct password is entered at the device. If the "job-password" (octetString(255)) Operation attribute (See [prod-print2] section 4.1) is supported, this value MUST be supported.

1881

1882

1883

'proof-print-wait' (J): The job is currently being held until the operator verifies the output of the proof print and performs a Release-Job operation. If the "proof-print" (collection) Job Template attribute (See [prod-print2] section 5.9) is supported, this value MUST be supported.

1884 **'resources-are-not-supported' (JD):** At least one of the resources needed by the job/document, such as
 1885 media, fonts, resource objects, etc., is not supported on any of the physical printers for which the
 1886 job/document is a candidate. This condition MAY be detected when the job/document is accepted,
 1887 or subsequently while the job/document is pending or processing, depending on implementation.
 1888 The job/document may (1) remain in its current state, (2) be moved to the 'pending-held' state,
 1889 depending on implementation and/or job scheduling policy, or (3) scheduled normally, but the Printer
 1890 is put into the 'stopped' state when the job/document is attempted to be processed on the Printer.
 1891 This value is intended for use with an implementation that supports the "user-defined-values-
 1892 supported" Printer attribute (see [prod-print] section 6.1) which allows a job to be accepted with an
 1893 unsupported 'name' value.

1894 **'resources-are-not-ready' (JD):** At least one of the resources needed by the job/document, such as media,
 1895 fonts, resource objects, etc., is not ready on any of the physical printer's for which the job/document
 1896 is a candidate. This condition MAY be detected when the job/document is accepted, or
 1897 subsequently while the job/document is pending or processing, depending on implementation. The
 1898 job/document may remain in its current state or be moved to the 'pending-held' state, depending on
 1899 implementation and/or job/document scheduling policy.

1900 **'[job-]incoming' (JD):** Either (1) the Printer has accepted the Create-Job operation and is expecting
 1901 additional Send-Document and/or Send-URI operations or (2) the Printer is retrieving/accepting
 1902 document data as a result of a Print-Job, Print-URI, Send-Document or Send-URI operation.

1903 **'[job-]spooling' (JD):** Same as 'job-incoming' with the specialization that the Printer is spooling the
 1904 Job/Document data before processing it. This value corresponds to the 'spool' or 'automatic' value of
 1905 the "job-spooling-supported" Printer Description attribute.

1906 **'[job-]streaming' (JD):** Same as 'job-incoming' with the specialization that the Printer is processing the
 1907 Job/Document data as it is being received (that is, the document is not being spooled, but rather is
 1908 being processed in chunks by the output device and is being imaged during reception). This value
 1909 corresponds to the 'stream' or 'automatic' value of the "job-spooling-supported" Printer Description
 1910 attribute.

1911 **'job-data-insufficient' (J):** The Create-Job operation has been accepted by the Printer, but the Printer is
 1912 expecting additional document data before it can move the job into the 'processing' state. If a Printer
 1913 starts processing before it has received all data, the Printer removes the 'job-data-insufficient'
 1914 reason, but the 'job-incoming' remains. If a Printer starts processing after it has received all data, the
 1915 Printer removes the 'job-data-insufficient' reason and the 'job-incoming' at the same time.

1916 **'unsupported-compression' (JD):** The job/document was aborted by the system because the Printer
 1917 determined while attempting to decompress the document-data's that the compression is actually not
 1918 among those supported by the Printer. This value MUST be supported, since "compressions is a
 1919 REQUIRED operation attribute.

1920 **'compression-error' (JD):** The job/document was aborted by the system because the Printer encountered
 1921 an error in the document-data while decompressing it. If the Printer posts this reason, the document-
 1922 data has already passed any tests that would have led to the 'unsupported-compression' job-state-
 1923 reason/document-state-reason.

1924 **'document-access-error' (JD):** After accepting a Print-URI or Send-URI request, the Printer could not
 1925 access one or more documents passed by reference. This reason is intended to cover any file
 1926 access problem, including file does not exist and access denied because of an access control
 1927 problem. The Printer MAY also indicate the document access error using the "job-document-access-
 1928 errors" Job Description attribute (see the description of "job-document-access-errors" above).
 1929 Whether the Printer aborts the job/document and moves the job/document to the 'aborted' job state
 1930 or prints all documents that are accessible and moves the job/document to the 'completed'
 1931 job/document state and adds the 'completed-with-errors' value in the job's "job-state-reasons" or
 1932 document's "document-state-reasons" attribute depends on implementation and/or site policy. This
 1933 value SHOULD be supported if the Print-URI or Send-URI operations are supported.

- 1934 **'unsupported-document-format' (JD):** The job/document was aborted by the system because the
 1935 document-data's document-format is not among those supported by the Printer. If the client
 1936 specifies the document-format as 'application/octet-stream', the printer MAY abort the job/document
 1937 and post this reason even though the format is a member of the "document-format-supported" printer
 1938 attribute, but not among the auto-sensed document-formats. This value MUST be supported, since
 1939 "document-format" is a REQUIRED operation attribute.
- 1940 **'document-format-error' (JD):** The job/document was aborted by the system because the Printer
 1941 encountered an error in the document-data while processing it. If the Printer posts this reason, the
 1942 document-data has already passed any tests that would have led to the 'unsupported-document-
 1943 format' job-state-reason/document-state-reason.
- 1944 **'submission-interrupted' (JD):** The job or document was not completely submitted for some unforeseen
 1945 reason, such as: (1) the Printer has crashed before the job was closed by the client, (2) the Printer or
 1946 the document transfer method has crashed in some non-recoverable way before the document data
 1947 was entirely transferred to the Printer, (3) the client crashed or failed to close the job before the time-
 1948 out period. See the description of the "multiple-operation-time-out" Printer attribute in [RFC2911]
 1949 Section 4.4.31.
- 1950 **'[job-]outgoing' (JD):** The Printer is transmitting the job/document to the output device.
- 1951 **'job-scheduling' (J):** The printer is in the process of scheduling the processing for the Job.
- 1952 **'[job-]queued' (JD):** Job is in the 'processing' state, but more specifically, the Printer has queued the
 1953 Document data.
- 1954 **'[job-]transforming' (JD):** Job/document is in the 'processing' state, but more specifically, the Printer is
 1955 interpreting document data and producing another electronic representation.
- 1956 **'[job-]interpreting' (JD):** Job/document is in the 'processing' state, but more specifically, the Printer is
 1957 interpreting the document data.
- 1958 **'[job-]queued-for-marker' (JD):** Job/document is in any of the 'pending-held', 'pending', or 'processing'
 1959 states, but more specifically, the Printer has completed enough processing of the document to be
 1960 able to start marking and the job/document is waiting for the marker. Systems that require human
 1961 intervention to release jobs using the Release-Job operation, put the job into the 'pending-held' job
 1962 state. Systems that automatically select a job to use the marker put the job into the 'pending' job
 1963 state or keep the job in the 'processing' job state while waiting for the marker, depending on
 1964 implementation. All implementations put the job/document into (or back into) the 'processing' state
 1965 when marking does begin.
- 1966 **'[job-]printing' (JD):** The output device is marking media. This value is useful for Printers which spend a
 1967 great deal of time processing (1) when no marking is happening and then want to show that marking
 1968 is now happening or (2) when the job/document is in the process of being canceled or aborted while
 1969 the job/document remains in the 'processing' state, but the marking has not yet stopped so that
 1970 impression or sheet counts are still increasing for the job/document.
- 1971 **'printer-stopped-partly' (J):** The value of the Printer's "printer-state-reasons" attribute contains the value
 1972 'stopped-partly'.
- 1973 **'printer-stopped' (J):** The value of the Printer's "printer-state" attribute is 'stopped'.
- 1974 **'job-suspending' (J):** The printer is in the process of moving the Job from a processing condition to a
 1975 suspended condition where other jobs can be processed.
- 1976 **'job-suspended' (J):** The job has been suspended while processing using the Suspend-Current-Job
 1977 operation and other jobs can be processed on the Printer. The Job can be resumed using the
 1978 Resume-Job operation which removes this value. Note: Documents cannot be suspended and there
 1979 is no Suspend-Current-Documents operation.
- 1980 **'job-suspended-by-operator' (J):** The Job has been indefinitely suspended by the printer operator.

- 1981 **'job-suspended-by-user' (J)**: The Job has been indefinitely suspended by the user.
- 1982 **'job-suspended-by-system' (J)**: The Job has been indefinitely suspended by the Printer's system software
1983 during normal processing of the job.
- 1984 **'job-resuming' (J)**: The printer is in the process of moving the Job from a suspended condition to become a
1985 candidate for processing.
- 1986 **'[job-]canceled-by-user' (JD)**: The job/document was canceled by the owner of the job using the Cancel-
1987 Job/Cancel-Document request, i.e., by a user whose authenticated identity is the same as the value
1988 of the originating user that created the Job object, or by some other authorized end-user, such as a
1989 member of the job owner's security group. This 'job-canceled' value SHOULD be supported. The
1990 'canceled-by-user' value SHOULD be supported for the "document-state-reasons" attributes for use
1991 with the Cancel-Document.
- 1992 **'[job-]canceled-by-operator' (JD)**: The job/document was canceled by the operator using the Cancel-
1993 Job/Cancel-Document request, i.e., by a user who has been authenticated as having operator
1994 privileges (whether local or remote). If the security policy is to allow anyone to cancel anyone's
1995 job/document, then these values may be used when the job/document is canceled by other than the
1996 owner of the job. For such a security policy, in effect, everyone is an operator as far as canceling
1997 jobs/documents is concerned. These values SHOULD be supported if the implementation permits
1998 canceling by other than the owner of the job.
- 1999 **'[job-]canceled-at-device' (JD)**: The job/document was canceled by an unidentified local user, i.e., a user
2000 at a console at the device. This value SHOULD be supported if the implementation supports
2001 canceling jobs/documents at the console.
- 2002 **'aborted-by-system' (JD)**: The job/document (1) is in the process of being aborted, (2) has been aborted by
2003 the system and placed in the 'aborted' state, or (3) has been aborted by the system and placed in the
2004 'pending-held' state, so that a user or operator can manually try the job/document again. This value
2005 SHOULD be supported.
- 2006 **'processing-to-stop-point' (J)**: The requester has issued a Cancel-Job/Cancel-Document operation or the
2007 Printer object has aborted the job/document, but is still performing some actions on the job/document
2008 until a specified stop point occurs or job/document termination/cleanup is completed.
2009 If the implementation requires some measurable time to cancel the job/document in the 'processing'
2010 or 'processing-stopped' job/document states, the Printer MUST use this value to indicate that the
2011 Printer object is still performing some actions on the job/document while the job/document remains in
2012 the 'processing' or 'processing-stopped' state. After all the job's/document's job/document
2013 description attributes have stopped incrementing, the Printer object moves the job/document from
2014 the 'processing' state to the 'canceled' or 'aborted' job/document states.
- 2015 **'service-off-line' (J)**: The Printer is off-line and accepting no jobs. All 'pending' jobs are put into the
2016 'pending-held' state. This situation could be true if the service's or document transform's input is
2017 impaired or broken.
- 2018 **'[job-]warnings-detected' (JD)**: If the Printer supports these values, the Printer MUST add the value to "job-
2019 state-reasons" / "document-state-reasons" when it generates the first warning message. That is, a
2020 single occurrence of this value is present in the "job-state-reasons" / "document-state-reasons" if the
2021 Printer has generated one or more warnings.
- 2022 **'[job-]completed-successfully' (JD)**: The job/document completed successfully. There were no warnings
2023 or errors in printing. This value SHOULD be supported.
- 2024 **'[job-]completed-with-warnings' (JD)**: The print part of the job/document completed with warnings
2025 (whether or not there were save errors). This value SHOULD be supported if the implementation
2026 detects warnings. [RFC2911]
- 2027 **'[job-]completed-with-errors' (JD)**: The print part of the job/document completed with errors (and possibly
2028 warnings too) (whether or not there were save errors). This value SHOULD be supported if the
2029 implementation detects errors. [RFC2911]

- 2030 **'job-saving' (J):** The Printer is transmitting the Job to the save location. This is similar to the 'job-printing'
2031 value.
- 2032 **'job-saved-successfully' (J):** The Printer saved the Job successfully.
- 2033 **'job-save-error' (J):** The Printer did not save the Job successfully (whether or not it was printed successfully,
2034 printed with warnings, printed with errors, or not printed). The Printer MUST ensure that none of the
2035 saved job is accessible, if it was unable to successfully save all of the job.
- 2036 **'job-restartable' (J):** This job is retained (see the description of "job-state" above, specifically "Partitioning of
2037 Job States") and is currently able to be restarted using the Restart-Job operation (see [RFC2911]
2038 Section 3.3.7). If 'job-restartable' is a value of the job's "job-state-reasons" attribute, then the Printer
2039 MUST accept a Restart-Job operation for that job. This value SHOULD be supported if the Restart-
2040 Job operation is supported.
- 2041 **'queued-in-device' (JD):** The job/document has been forwarded to a device or print system that is unable to
2042 send back status. The Printer sets the job's/document's "job-state" / "document-state" attribute to
2043 'completed' and adds the 'queued-in-device' value to the job's/document's "job-state-reasons" /
2044 "document-state-reasons" attribute to indicate that the Printer has no additional information about the
2045 job/document and never will have any better information. See the description of the "job-state" /
2046 "document-state" attribute above, specifically the portion on "Forwarding Servers".
- 2047 NOTE: The semantics of this attribute or the set of valid values may be different for different document formats.

2048 **8.198.2.19 document-uri** (uri)**

2049 This Document Description attribute is the URI that the client supplied in [the corresponding operation attribute in](#) a
2050 Send-URI operation ([see \[RFC2911\] section 3.3.2](#)). The Printer MUST support this attribute if the Printer supports
2051 the Send-URI operation (see section 3.4).

2052 **8.2.20 impressions-completed-current-copy (integer(0:MAX))**

2053 [This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description](#)
2054 [attribute \(see \[job-prog\] §4.4\) applied to the Document object.](#)

2055 **8.2.21ipp-attribute-fidelity (boolean)**

2056 ~~This OPTIONAL Document Description attribute specifies the policy for the Printer to use (see [RFC2911] §3.2.1.1)~~
2057 ~~when the client supplies an unsupported attribute in a Document Creation operation. The Printer sets this Document~~
2058 ~~Description attribute from the corresponding operation attribute supplied by the client in the Document Creation~~
2059 ~~operation (see section 3.1).~~

2060 **8.2.21 [job-]detailed-status-message (1setOf text (MAX))**

2061 [This OPTIONAL "detailed-status-message" Document Description attribute has the same semantics as the](#)
2062 [corresponding "job-detailed-status-message" Job Description attribute \(see \[RFC2911\] §4.3.10\) applied to the](#)
2063 [Document object.](#)

2064 **8.2.22 [job-]document-access-errors (1setOf text(MAX))**

2065 [This OPTIONAL "document-access-errors" Document Description attribute has the same semantics as the](#)
2066 [corresponding "job-detailed-status-message" Job Description attribute \(see \[RFC2911\] §4.3.11\) applied to the](#)
2067 [Document object.](#)

2068 **8.2.23 job-id (integer(1:MAX))**

2069 This REQUIRED document description attribute is a copy of the "job-id" Job Description attribute (See [RFC2911]
2070 §4.3.2) of the job that contains this Document.

2071 **8.2.24 [job-]impressions (integer(0:MAX))**

2072 This OPTIONAL "impressions" Document Description attribute has the same semantics as the corresponding "job-
2073 impressions" Job Description attribute (see [RFC2911] §4.3.17.2) applied to the Document object. The Printer sets
2074 this Document Description attribute from the corresponding operation attribute supplied by the client in the Document
2075 Creation operation (see section 3.1).

2076 **8.2.25 [job-]impressions-completed (integer(0:MAX))**

2077 This OPTIONAL "impressions-completed" Document Description attribute has the same semantics as the
2078 corresponding "job-impressions-completed" Job Description attribute (see [RFC2911] §4.3.18.2) applied to the
2079 Document object.

2080 **8.2.26 [job-]k-octets (integer(0:MAX))**

2081 This OPTIONAL "k-octets" Document Description attribute has the same semantics as the corresponding "job-k-
2082 octets" Job Description attribute (see [RFC2911] §4.3.17.1) applied to the Document object. The Printer sets this
2083 Document Description attribute from the corresponding operation attribute supplied by the client in the Document
2084 Creation operation (see section 3.1).

2085 **8.2.27 [job-]k-octets-processed (integer(0:MAX))**

2086 This OPTIONAL "k-octets-processed" Document Description attribute has the same semantics as the corresponding
2087 "job-k-octets-processed" Job Description attribute (see [RFC2911] §4.3.18.1) applied to the Document object.

2088 **8.2.28 [job-]media-sheets (integer(0:MAX))**

2089 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
2090 media-sheets" Job Description attribute (see [RFC2911] §4.3.17.3) applied to the Document object. The Printer sets
2091 this Document Description attribute from the corresponding operation attribute supplied by the client in the Document
2092 Creation operation (see section 3.1).

2093 **8.2.29 [job-]media-sheets-completed (integer(0:MAX))**

2094 This OPTIONAL "media-sheets" Document Description attribute has the same semantics as the corresponding "job-
2095 media-sheets-completed" Job Description attribute (see [RFC2911] 4.3.18.3) applied to the Document object.

2096 **8.2.30 [job-]more-info (uri)**

2097 This OPTIONAL "more-info" Document Description attribute has the same semantics as the corresponding "job-
2098 more-info" Job Description attribute (see [RFC2911] §4.3.4) applied to the Document object.

2099 **8-338.2.31 [job-]document-printer-up-time (integer (1:MAX))**

2100 This REQUIRED "printer-up-time" Document Description attribute indicates the amount of time (in seconds) that the
2101 Printer implementation has been up and running. This attribute is an alias for the "printer-up-time" Printer Description
2102 attribute (see [RFC2911] section 4.4.29).

2103 A client MAY request this attribute in a Get-Document-Attributes or Get-Documents request and use the value
2104 returned in combination with other requested Event Time Job Description Attributes in order to display time attributes
2105 to a user. The difference between this attribute and the 'integer' value of a "time-at-xxx" attribute is the number of
2106 seconds ago that the "time-at-xxx" event occurred. A client can compute the wall-clock time at which the "time-at-
2107 xxx" event occurred by subtracting this difference from the client's wall-clock time.

2108 **8.2.32 job-printer-uri (uri)**

2109 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2110 attribute (see [RFC2911] §4.3.3) applied to the Document object.

2111 **8.2.33 job-uri (uri)**

2112 This REQUIRED document description attribute is a copy of the "job-uri" Job Description attribute (see [RFC2911]
2113 §4.3.1.) of the job that contains this Document.

2114 **8.2.34 [job-]warnings-count (integer(0:MAX))**

2115 This OPTIONAL "warnings-count" Document Description attribute has the same semantics as the corresponding
2116 "job-warnings-count" Job Description attribute (see [override] §6.1.) applied to the Document object. See [override]
2117 §6.1.

2118 **8.2.35 last-document (boolean)**

2119 This OPTIONAL Document Description attribute indicates whether or not this Document is the last Document in the
2120 Job. See [RFC2911] §4.3.12. The Printer sets this Document Description attribute from the corresponding
2121 operation attribute supplied by the client in the Document Creation operation (see section 3.1).

2122 **8.2.36 output-device-assigned (name(127))**

2123 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
2124 attribute (see [RFC2911] §4.3.7.2) applied to the Document object.

2125 **8.2.37 sheet-completed-copy-number (integer(0:MAX))**

2126 This OPTIONAL Document Description attribute has the same semantics as the corresponding Job Description
2127 attribute (see [job-prog] §4.2) applied to the Document object.

2128 **8.2.38 time-at-completed (integer (MIN:MAX))**

2129 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2130 attribute (see [RFC2911] §4.3.14.3) applied to the Document object.

2131 **8.2.39 time-at-creation (integer (MIN:MAX))**

2132 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2133 attribute (see [RFC2911] §4.3.14.1) applied to the Document object.

2134 **8.2.40 time-at-processing (integer (MIN:MAX))**

2135 This REQUIRED Document Description attribute has the same semantics as the corresponding Job Description
2136 attribute (see [RFC2911] §4.3.14.2) applied to the Document object.

2137 ~~ISSUE 03: The following 4 Job Creation operation attributes have corresponding Job Description attributes, but~~
 2138 ~~there isn't a definition or an IANA Registration for any of these Job Description attributes: "ipp-attribute-fidelity", "job-~~
 2139 ~~mandatory-attributes", "job-password", and "job-password-encryption". OK to add Job Description attribute~~
 2140 ~~descriptions for each of them? That would correspond to the PWG Semantic Model where they are Job Description~~
 2141 ~~attributes. Add the 4 definitions to the spec and the IANA Register - New Orleans.~~

2142 ~~ISSUE 04 repeat: The following 4 Job Creation operation attributes have corresponding Job Description attributes,~~
 2143 ~~since they are really Document attributes: "compression", "document-format", "document-name", "document-natural-~~
 2144 ~~language"? OK to add Document Description attribute descriptions for each of them? That would correspond to the~~
 2145 ~~PWG Semantic Model where they are Document Description attributes. Add the 4 attributes as Document~~
 2146 ~~Description attributes and the IANA Register (but do not add as Job Description attributes) - New Orleans.~~

2147 ~~ISSUE 05: The Printer copies the following 11 Document Creation operation attributes to corresponding Document~~
 2148 ~~Description attributes, but there isn't a definition or an IANA Registration for any of these Document Description~~
 2149 ~~attributes: "attributes-charset", "attributes-natural-language", "compression", "document-format", "document-name",~~
 2150 ~~"document-natural-language", "impressions", "k-octets", "media-sheets", "job-printer-uri", and "last-document". OK to~~
 2151 ~~add operation attribute and Document Description attribute descriptions for each of them? Yes, add the 11~~
 2152 ~~attributes to the spec and the IANA Register - New Orleans.~~

2153 ~~ISSUE 06: The definitions of the following 16 remaining Document Description attributes are derived from the~~
 2154 ~~corresponding Job Description attributes that are not set by the client: "current-page-order", "date-time-at-~~
 2155 ~~completed", "date-time-at-creation", "date-time-at-processing", "detailed-status-message", "document-access-errors",~~
 2156 ~~"impressions-completed", "impressions-completed-current-copy", "k-octets-processed", "media-sheets-completed",~~
 2157 ~~"more-info", "sheet-completed-copy-number", "time-at-completed", "time-at-creation", "time-at-processing", and~~
 2158 ~~"warnings-count", OK to add Document Description attribute descriptions for each of them? Yes, add the 16~~
 2159 ~~attributes to the spec and the IANA Register - New Orleans.~~

2160 9 Printer attributes

2161 This section lists *all* of the Printer attributes defined in other IPP documents. Printer attributes are divided into three
 2162 disjoint groups:
 2163

Job Template attributes (JT)	These Printer attributes are related directly to the "xxx" Job Template attributes that a client can supply in a Job Creation request as follows: 1. "xxx-supported" indicate the supported values 2. "xxx-default" indicate the values that will be used if the client and the PDL omit the attribute. 3. "xxx-ready" indicate the supported values that are available without human intervention, for those few attributes that require human intervention, such as "media" and possibly "finishing".
Printer Description attributes (PD)	These Printer attributes describe the Printer, such as "printer-name" and "printer-location". Some of them are "xxx-supported" and "xxx-default" for Operation attributes that the client can supply in a Job Creation request.
neither (-)	These Printer attributes describe supported and defaults for member attributes of collection Job Template attributes.

2164
 2165 In a Get-Printer-Attributes request, a client can request all of the Printer attributes in the Job Template (JT) or Printer
 2166 Description (PD) groups by supplying the 'job-template' or 'printer-description' group name, respectively. The client
 2167 can also request "all". The column labels are:

2168 **"Attribute Syntax"** - indicates the attribute syntax (see [RFC2911] section 4.1). Many "xxx-default" and "xxx-
 2169 supported" attributes have the 'collection' syntax which consists of a number of member attributes.
 2170 These member attributes are not listed in this table when they are the same as the corresponding

2171 “xxx” attribute in Table 8. Only those few Printer attribute collection attributes that do not have a
2172 corresponding Job Template attributes show the member attributes in this table.

2173 “Grp” - indicates to which group the attribute belongs.

2174 “Printer Conf.” - indicates the IPP/1.1 Printer conformance requirements for supporting the attribute. Those
2175 attributes labeled as “MAY” may have conditional requirements that require their support, if the
2176 Printer supports a related attribute, operation, or feature. For example, all Job Template attributes
2177 are OPTIONAL for a Printer to support. However, if a Printer supports Job Template attribute “xxx”,
2178 then it MUST also support the corresponding “xxx-default” and “xxx-supported” attributes. Similarly,
2179 if Event Notification is supported, then some of the attributes indicated as “MAY” in this table become
2180 MUST.

2181 “Reference” - lists the IETF or IEEE-ISTO specification which defines the semantics of the attribute.

2182 **Table 13 - Printer attributes (Job Template and Printer Description)**

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
charset-configured	charset	PD	MUST	[RFC2911] §4.4.17
charset-supported	1setOf charset	PD	MUST	[RFC2911] §4.4.18
color-supported	boolean	PD	MAY	[RFC2911] §4.4.26
compression-supported	type3 keyword	PD	MUST	[RFC2911] §4.4.32
copies-default	integer(1:MAX)	JT	MAY	[RFC2911] §4.2.5
copies-supported	rangeOfInteger(1:MAX)	JT	MAY	[RFC2911] §4.2.5
cover-back-default	collection	JT	MAY	[prod-print] §3.1.3
cover-back-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.1.4
cover-front-default	collection	JT	MAY	[prod-print] §3.1.3
cover-front-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.1.4
cover-type-supported	1setOf type2 keyword	-	MAY	[prod-print] §3.1.2.1
document-creation-attributes- supported	1setOf type2 keyword	PD	MAY	[this-spec] §9.1
document-format-default	mimeMediaType	PD	MUST	[RFC2911] §4.4.21
document-format-supported	1setOf mimeMediaType	PD	MUST	[RFC2911] §4.4.22
document-format-varying-attributes	1setOf type2 keyword	PD	MAY	[set-ops] §6.3
document-overrides-supported	1setOf type2 keyword		MAY	[override] §5.1.14
finishings-col-default	collection	JT	MAY	[prod-print] §3.2.3
finishings-col-ready	1setOf collection	JT	MAY	[prod-print] §3.2.4
finishings-col-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.2.5
finishings-default	1setOf type2 enum	JT	MAY	[RFC2911] §4.2.6
finishings-ready	1setOf type2 enum	JT	MAY	[RFC2911] §4.2.6
finishings-supported	1setOf type2 enum	JT	MAY	[RFC2911] §4.2.6
finishing-template-supported	1setOf name(MAX)	-	MAY	[prod-print] §3.2.1.1
force-front-side-default	1setOf integer(1:MAX)	JT	MAY	[prod-print] §3.3
force-front-side-supported	rangeOfInteger(1:MAX)	JT	MAY	[prod-print] §3.3
generated-natural-language- supported	1setOf naturalLanguage	PD	MUST	[RFC2911] §4.4.20
imposition-template-default	type3 keyword name(MAX)	-	MAY	[prod-print] §3.4
imposition-template-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.4
insert-after-page-number-supported	rangeOfInteger(0:MAX)	-	MAY	[prod-print] §3.5.1.1
insert-count-supported	rangeOfInteger(0:MAX)	-	MAY	[prod-print] §3.5.2.1
insert-sheet-default	1setOf collection	JT	MAY	[prod-print] §3.5.4
insert-sheet-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.5.5

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
ippget-event-life	integer(15:MAX)	PD	MAY	[get-method] §8.1
ipp-versions-supported	1setOf type2 keyword	PD	MUST	[RFC2911] §4.4.20
job-account-id-default	name(MAX)	JT	MAY	[prod-print] §3.6
job-account-id-supported	boolean	JT	MAY	[prod-print] §3.6
job-accounting-output-bin-default	type3 keyword name(MAX)	-	MAY	[prod-print] §3.8.3.1
job-accounting-output-bin-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.8.3.2
job-accounting-sheets-default	collection	JT	MAY	[prod-print] §3.8.4
job-accounting-sheets-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.8.5
job-accounting-sheets-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.8.1.1
job-accounting-user-id-default	name(MAX)	JT	MAY	[prod-print] §3.7
job-accounting-user-id-supported	boolean	JT	MAY	[prod-print] §3.7
job-creation-attributes-supported	1setOf type2 keyword	PD	MAY	[prod-print2] §7.1
job-error-sheet-default	collection	JT	MAY	[prod-print] §3.7
job-error-sheet-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.9.5
job-error-sheet-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.9.1.1
job-error-sheet-when-supported	1setOf type2 keyword	-	MAY	[prod-print] §3.9.2.1
job-hold-until-default	type3 keyword name(MAX)	JT	MAY	[RFC2911] §4.2.2
job-hold-until-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[RFC2911] §4.2.2
job-impressions-supported	rangeOfInteger(0:MAX)	PD	MAY	[RFC2911] §4.4.34
job-k-octets-supported	rangeOfInteger(0:MAX)	PD	MAY	[RFC2911] §4.4.33
job-media-sheets-supported	rangeOfInteger(0:MAX)	PD	MAY	[RFC2911] §4.4.35
job-message-to-operator-default	text(MAX)	JT	MAY	[prod-print] §3.12
job-message-to-operator-supported	boolean	JT	MAY	[prod-print] §3.12
job-password-supported	integer(0:127)	PD	MAY	[prod-print2] §7.2
job-password-encryption-supported	1setOf (type3 keyword name(MAX))	PD	MAY	[prod-print2] §7.3
job-priority-default	integer(1:100)	JT	MAY	[RFC2911] §4.2.1
job-priority-supported	1setOf integer(1:100)	JT	MAY	[RFC2911] §4.2.1
job-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[set-ops] §6.2
job-sheet-message-default	text(MAX)		MAY	[prod-print] §3.12
job-sheet-message-supported	boolean		MAY	[prod-print] §3.12
job-sheets-col-default	collection	JT	MAY	[prod-print] §3.11.3
job-sheets-col-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.11.4
job-sheets-default	type3 keyword name(MAX)	JT	MAY	[RFC2911] §4.2.3
job-sheets-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[RFC2911] §4.2.3
job-spooling-supported	type2 keyword	PD	MAY	[prod-print2] §7.4
max-save-info-supported	integer(1:MAX)	PD	MAY	[prod-print2] §7.5
max-stitching-locations-supported	integer(1:MAX)	PD	MAY	[prod-print] §5.2
media-back-coating-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.13.10.2

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
media-col-database <i>any "media-col" member attribute</i>	1setOf collection	- ⁴⁵	MAY	[prod-print2] §7.6
media-col-default <i>any "media-col" member attribute</i>	collection	JT	MAY	[prod-print] §3.13.12
media-color-supported	1setOf type2 keyword	-	MAY	[prod-print] §3.13.4.1
media-col-ready <i>any "media-col" member attribute</i>	1setOf collection	JT	MAY	[prod-print] §3.13.13
media-col-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.13.14
media-default	type3 keyword name(MAX)	JT	MAY	[RFC2911] §4.2.11
media-front-coating-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.13.10.1
media-hole-count-supported	1setOf rangeOfInteger(0:MAX)	-	MAY	[prod-print] §3.13.6.1
media-info-supported	boolean	-	MAY	[prod-print] §3.13.3.1
media-input-tray-check-default	type3 keyword name(MAX)	JT	MAY	[prod-print] §3.14
media-input-tray-check-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[prod-print] §3.14
media-key-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.13.1.1
media-order-count-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[prod-print] §3.13.7.1
media-pre-printed-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.13.5.1
media-ready	1setOf (type3 keyword name(MAX))	JT	MAY	[RFC2911] §4.2.11
media-recycled-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.13.11.1
media-size-supported	1setOf collection	-	MAY	[prod-print] §3.13.8.3
media-supported	1setOf (type3 keyword name(MAX))	JT	MAY	[RFC2911] §4.2.11
media-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.13.2.1
media-weight-metric-supported	1setOf rangeOfInteger(1:MAX)	-	MAY	[prod-print] §3.13.9.1
multiple-document-handling-default	type2 keyword	JT	MAY	[RFC2911] §4.2.4
multiple-document-handling-supported	1setOf type2 keyword	JT	MAY	[RFC2911] §4.2.4
multiple-document-jobs-supported	boolean	PD	MAY	[RFC2911] §4.4.16
multiple-operation-time-out	integer(1:MAX)	PD	MAY	[RFC2911] §4.4.31
natural-language-configured	naturalLanguage	PD	MUST	[RFC2911] §4.4.19
notify-attributes-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.4
notify-events-default	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-events-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.3
notify-lease-duration-default	integer(0:67108863)	PD	MAY	[ntfy] §5.3.8
notify-lease-duration-supported	1setOf (integer(0: 67108863) rangeOfInteger(0:67108863))	PD	MAY	[ntfy] §5.3.8
notify-lease-expiration-time	integer(0:MAX)	PD	MAY	[ntfy] §5.4.3
notify-max-events-supported	integer(2:MAX)	PD	MAY	[ntfy] §5.3.3
notify-pull-method-supported	1setOf type2 keyword	PD	MAY	[ntfy] §5.3.2

⁴⁵ The "media-col-database" attribute is not returned when the client requests 'all' or 'printer-description' attribute group because there MAY be a large number of values. Instead the client MUST query "media-col-database" explicitly in a Get-Printer-Attributes request.

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
notify-schemes-supported	1setOf uriScheme	PD	MAY	[ntfy] §5.3.1
number-up-default	integer(1:MAX)	JT	MAY	[RFC2911] §4.2.9
number-up-supported	1setOf (integer(1:MAX) rangeOfInteger(1:MAX))	JT	MAY	[RFC2911] §4.2.9
operations-supported	1setOf type2 enum	PD	MUST	[RFC2911] §4.4.15
orientation-requested-default	type2 enum	JT	MAY	[RFC2911] §4.2.10
orientation-requested-supported	1setOf type2 enum	JT	MAY	[RFC2911] §4.2.10
output-bin-default	type2 keyword name(MAX)	JT	MAY	[output-bin] §2.1
output-bin-supported	1setOf (type2 keyword name(MAX))	JT	MAY	[output-bin] §2.1
page-delivery-default	type2 keyword	JT	MAY	[prod-print] §3.15
page-delivery-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.15
page-order-received-default	type2 keyword	JT	MAY	[prod-print] §3.16
page-order-received-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.16
page-overrides-supported	1setOf type2 keyword	PD	MAY	[override] §5.2.9
page-ranges-supported	boolean	JT	MAY	[RFC2911] §4.2.7
pages-per-minute	integer(0:MAX)	PD	MAY	[RFC2911] §4.4.36
pages-per-minute-color	integer(0:MAX)	PD	MAY	[RFC2911] §4.4.37
pages-per-subset-supported	boolean	PD	MAY	[override] §5.3.2
parent-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.2
pdl-override-supported	type2 keyword	PD	MUST	[RFC2911] §4.4.28 [prod-print2] §8.1
presentation-direction-number-up-default	type2 keyword	JT	MAY	[prod-print] §3.17
presentation-direction-number-up-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.17
printer-current-time	dateTime	PD	MAY	[RFC2911] §4.4.30
printer-detailed-status-messages	1setOf text(MAX)	PD	MAY	[prod-print2] §7.7
printer-driver-installer	uri	PD	MAY	[RFC2911] §4.4.8
printer-info	text(127)	PD	MAY	[RFC2911] §4.4.6
printer-is-accepting-jobs	boolean	PD	MUST	[RFC2911] §4.4.23
printer-location	text(127)	PD	MAY	[RFC2911] §4.4.5
printer-make-and-model	text(127)	PD	MAY	[RFC2911] §4.4.9
printer-message-date-time	dateTime	PD	MAY	[set-ops] §6.5
printer-message-from-operator	text(127)	PD	MAY	[RFC2911] §4.4.25
printer-message-time	integer(MIN:MAX)	PD	MAY	[set-ops] §6.4
printer-more-info	uri	PD	MAY	[RFC2911] §4.4.7
printer-more-info-manufacturer	uri	PD	MAY	[RFC2911] §4.4.10
printer-name	name(127)	PD	MUST	[RFC2911] §4.4.4
printer-notify-server-uri	uri	PD	MAY	[not-srv] §4.1
printer-resolution-default	resolution	JT	MAY	[RFC2911] §4.2.12
printer-resolution-supported	1setOf resolution	JT	MAY	[RFC2911] §4.2.12
printer-settable-attributes-supported	1setOf type2 keyword	PD	MAY	[set-ops] §6.1
printer-state	type1 enum	PD	MUST	[RFC2911] §4.4.11
printer-state-change-date-time	dateTime	PD	MAY	[ntfy] §6.2
printer-state-change-time	integer(1:MAX)	PD	MAY	[ntfy] §6.1
printer-state-message	text(MAX)	PD	MAY	[RFC2911] §4.4.13
printer-state-reasons	1setOf type2 keyword	PD	MUST	[RFC2911] §4.4.12
printer-up-time	integer(1:MAX))	PD	MUST	[RFC2911] §4.4.29
printer-uri-supported	1setOf uri	PD	MUST	[RFC2911] §4.4.1

Printer attribute name (Job Template & Printer Description)	Attribute Syntax	Grp	Printer Conf.	Reference
printer-xri-supported	1setOf collection	PD	MAY	[set-ops] §6.6
xri-uri	uri	PD	MUST	[set-ops] §6.6
xri-authentication	1setOf type2 keyword	PD	MUST	[set-ops] §6.6
xri-security	1setOf type2 keyword	PD	MUST	[set-ops] §6.6
print-quality-default	type2 enum	JT	MAY	[RFC2911] §4.2.13
print-quality-supported	1setOf type2 enum	JT	MAY	[RFC2911] §4.2.13
queued-job-count	integer(0:MAX)	PD	MUST	[RFC2911] §4.4.24
reference-uri-schemes-supported	1setOf uriScheme	PD	MAY	[RFC2911] §4.4.27
separator-sheets-default	collection	JT	MAY	[prod-print] §3.18.3
separator-sheets-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.18.4
separator-sheets-type-supported	1setOf (type3 keyword name(MAX))	-	MAY	[prod-print] §3.18.1.1
sheet-collate-default	type2 keyword	JT	MAY	[job-prog] §3.1
sheet-collate-supported	1setOf type2 keyword	JT	MAY	[job-prog] §3.1
sides-default	type2 keyword	JT	MAY	[RFC2911] §4.2.8
sides-supported	1setOf type2 keyword	JT	MAY	[RFC2911] §4.2.8
stitching-locations-supported	1setOf (integer(0:MAX) rangeOfInteger(0:MAX))	-	MAY	[prod-print] §3.2.2.3.1
stitching-offset-supported	1setOf (integer (0:MAX) rangeOfInteger(0:MAX))	-	MAY	[prod-print] §3.2.2.2.1
stitching-reference-edge-supported	1setOf type2 keyword		MAY	[prod-print] §3.2.2.1.1
subordinate-printers-supported	1setOf uri	PD	MAY	[adm-ops] §7.1
uri-authentication-supported	1setOf type2 keyword	PD	MUST	[RFC2911] §4.4.2
uri-security-supported	1setOf type2 keyword	PD	MUST	[RFC2911] §4.4.3
user-defined-values-supported	1setOf type2 keyword	PD	MAY	[prod-print] §5.1
which-jobs-supported	1setOf type2 keyword	PD	MAY	[prod-print2] §7.8
x-image-position-default	type2 keyword	JT	MAY	[prod-print] §3.19.2
x-image-position-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.19.2
x-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.3
x-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.3
xri-authentication-supported	1setOf type2 keyword	PD	MAY	[set-ops] §6.8
xri-security-supported	1setOf type2 keyword	PD	MAY	[set-ops] §6.9
xri-uri-scheme-supported	1setOf uriScheme	PD	MAY	[set-ops] §6.7
x-side1-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.4
x-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.4
x-side2-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.5
x-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.5
y-image-position-default	type2 keyword	JT	MAY	[prod-print] §3.19.6
y-image-position-supported	1setOf type2 keyword	JT	MAY	[prod-print] §3.19.6
y-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.7
y-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.7
y-side1-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.8
y-side1-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.8
y-side2-image-shift-default	integer(MIN:MAX)	JT	MAY	[prod-print] §3.19.9
y-side2-image-shift-supported	rangeOfInteger(MIN:MAX)	JT	MAY	[prod-print] §3.19.9

2183

2184

9.1 document-creation-attributes-supported (1setOf type2 keyword)

2185

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

2186

2187 **9.2 printer-state-reasons (1setOf type2 keyword)**

IPP Printer Description attribute name	IPP Attribute Syntax plus Values	Printer conformance	Reference
printer-state-reasons	1setOf type2 keyword	MUST	[RFC2911] §4.4.12
	other	MAY	[RFC2911] §4.4.12
	none	MUST	[RFC2911] §4.4.12
	connecting-to-device	MAY	[RFC2911] §4.4.12
	cover-open	MAY	[RFC2911] §4.4.12
	deactivated	MAY	[adm-ops] §8.2
	developer-empty	MAY	[RFC2911] §4.4.12
	developer-low	MAY	[RFC2911] §4.4.12
	door-open	MAY	[RFC2911] §4.4.12
	fuser-over-temp	MAY	[RFC2911] §4.4.12
	fuser-under-temp	MAY	[RFC2911] §4.4.12
	hold-new-jobs	MAY	[adm-ops] §8.1
	input-tray-missing	MAY	[RFC2911] §4.4.12
	interlock-open	MAY	[RFC2911] §4.4.12
	interpreter-resource-unavailable	MAY	[RFC2911] §4.4.12
	marker-supply-empty	MAY	[RFC2911] §4.4.12
	marker-supply-low	MAY	[RFC2911] §4.4.12
	marker-waste-almost-full	MAY	[RFC2911] §4.4.12
	marker-waste-full	MAY	[RFC2911] §4.4.12
	media-empty	MAY	[RFC2911] §4.4.12
	media-jam	MAY	[RFC2911] §4.4.12
	media-low	MAY	[RFC2911] §4.4.12
	media-needed	MAY	[RFC2911] §4.4.12
	moving-to-paused	CMUST ⁴⁶	[RFC2911] §4.4.12
	opc-life-over	MAY	[RFC2911] §4.4.12
	opc-near-eol	MAY	[RFC2911] §4.4.12
	output-area-almost-full	MAY	[RFC2911] §4.4.12
	output-area-full	MAY	[RFC2911] §4.4.12
	output-tray-missing	MAY	[RFC2911] §4.4.12
	paused	CMUST ⁴⁷	[RFC2911] §4.4.12
	shutdown	MAY	[RFC2911] §4.4.12
	spool-area-full	SHOULD	[RFC2911] §4.4.12
	stopped-partly	MAY	[RFC2911] §4.4.12
	stopping	MAY	[RFC2911] §4.4.12
	timed-out	MAY	[RFC2911] §4.4.12
	toner-empty	MAY	[RFC2911] §4.4.12
	toner-low	MAY	[RFC2911] §4.4.12

2188

2189 This description is taken from [RFC2911] with additions from other IPP extension documents:

⁴⁶ The 'moving-to-paused' value MUST be supported if the Pause-Printer operation is supported and it takes significant time to move to paused.

⁴⁷ The 'paused' value MUST be supported if the Pause-Printer operation is supported.

- 2190 This REQUIRED Printer attribute supplies additional detail about the device's state. Some of these value
2191 definitions indicate conformance requirements; the rest are OPTIONAL.
- 2192 Each keyword value MAY have a suffix to indicate its level of severity. The three levels are: report (least severe),
2193 warning, and error (most severe).
- 2194 **'-report'**: This suffix indicates that the reason is a "report". An implementation may choose to omit some or
2195 all reports. Some reports specify finer granularity about the printer state; others serve as a precursor
2196 to a warning. A report MUST contain nothing that could affect the printed output.
- 2197 **'-warning'**: This suffix indicates that the reason is a "warning". An implementation may choose to omit some
2198 or all warnings. Warnings serve as a precursor to an error. A warning MUST contain nothing that
2199 prevents a job from completing, though in some cases the output may be of lower quality.
- 2200 **'-error'**: This suffix indicates that the reason is an "error". An implementation MUST include all errors. If this
2201 attribute contains one or more errors, printer MUST be in the stopped state.
- 2202 If the implementation does not add any one of the three suffixes, all parties MUST assume that the reason is an
2203 "error".
- 2204 If a Printer object controls more than one output device, each value of this attribute MAY apply to one or more of the
2205 output devices. An error on one output device that does not stop the Printer object as a whole MAY appear as a
2206 warning in the Printer's "printer-state-reasons" attribute. If the "printer-state" for such a Printer has a value of
2207 'stopped', then there MUST be an error reason among the values in the "printer-state-reasons" attribute.
- 2208 The following standard keyword values are defined (in alphabetical order):
- 2209 **'other'**: The device has detected an error other than one listed in this document.
- 2210 **'none'**: There are not reasons. This state reason is semantically equivalent to "printer-state-reasons" without
2211 any value and MUST be used, since the 1setOf attribute syntax requires at least one value.
- 2212 **'connecting-to-device'**: The Printer object has scheduled a job on the output device and is in the process of
2213 connecting to a shared network output device (and might not be able to actually start printing the job
2214 for an arbitrarily long time depending on the usage of the output device by other servers on the
2215 network).
- 2216 **'cover-open'**: One or more covers on the device are open.
- 2217 **'deactivated'**: A client has issued a Deactivate-Printer operation for the Printer object (see [adm-ops]
2218 section 3.4.1) and the Printer is in the process of becoming deactivated or has become deactivated.
2219 The Printer MUST reject all requests except Activate-Printer, queries (Get-Printer-Attributes, Get-
2220 Job-Attributes, Get-Jobs, etc.), Send-Document, and Send-URI (so that partial job submission can
2221 be completed - see [adm-ops] section 3.1.1) and return the 'server-error-service-unavailable' status
2222 code.
- 2223 **'developer-empty'**: The device is out of developer.
- 2224 **'developer-low'**: The device is low on developer.
- 2225 **'door-open'**: One or more doors on the device are open.
- 2226 **'fuser-over-temp'**: The fuser temperature is above normal.
- 2227 **'fuser-under-temp'**: The fuser temperature is below normal.
- 2228 **'hold-new-jobs'**: The operator has issued the Hold-New-Jobs operation (see [adm-ops] section 3.3.1) or
2229 other means, but the output-device(s) are taking an appreciable time to stop. Later, when all output
2230 has stopped, the "printer-state" becomes 'stopped', and the 'paused' value replaces the 'moving-to-
2231 paused' value in the "printer-state-reasons" attribute. This value MUST be supported, if the Hold-

- 2232 New-Jobs operation is supported and the implementation takes significant time to pause a device in
2233 certain circumstances.
- 2234 **'input-tray-missing'**: One or more input trays are not in the device.
- 2235 **'interlock-open'**: One or more interlock devices on the printer are unlocked.
- 2236 **'interpreter-resource-unavailable'**: An interpreter resource is unavailable (i.e. font, form)
- 2237 **'marker-supply-empty'**: The device is out of at least one marker supply. (e.g. toner, ink, ribbon)
- 2238 **'marker-supply-low'**: The device is low on at least one marker supply. (e.g. toner, ink, ribbon)
- 2239 **'marker-waste-almost-full'**: The device marker supply waste receptacle is almost full.
- 2240 **'marker-waste-full'**: The device marker supply waste receptacle is full.
- 2241 **'media-empty'**: At least one input tray is empty.
- 2242 **'media-jam'**: The device has a media jam.
- 2243 **'media-low'**: At least one input tray is low on media.
- 2244 **'media-needed'**: A tray has run out of media.
- 2245 **'moving-to-paused'**: Someone has paused the Printer object using the Pause-Printer operation (see
2246 [RFC2911] section 3.2.7) or other means, but the device(s) are taking an appreciable time to stop.
2247 Later, when all output has stopped, the "printer-state" becomes 'stopped', and the 'paused' value
2248 replaces the 'moving-to-paused' value in the "printer-state-reasons" attribute. This value MUST be
2249 supported, if the Pause-Printer operation is supported and the implementation takes significant time
2250 to pause a device in certain circumstances.
- 2251 **'opc-life-over'**: The optical photo conductor is no longer functioning.
- 2252 **'opc-near-eol'**: The optical photo conductor is near end of life.
- 2253 **'output-area-almost-full'**: One or more output area is almost full (e.g. tray, stacker, collator).
- 2254 **'output-area-full'**: One or more output area is full. (e.g. tray, stacker, collator)
- 2255 **'output-tray-missing'**: One or more output trays are not in the device
- 2256 **'paused'**: Someone has paused the Printer object using the Pause-Printer operation (see [RFC2911] section
2257 3.2.7) or other means and the Printer object's "printer-state" is 'stopped'. In this state, a Printer
2258 MUST NOT produce printed output, but it MUST perform other operations requested by a client. If a
2259 Printer had been printing a job when the Printer was paused, the Printer MUST resume printing that
2260 job when the Printer is no longer paused and leave no evidence in the printed output of such a
2261 pause. This value MUST be supported, if the Pause-Printer operation is supported.
- 2262 **'shutdown'**: Someone has removed a Printer object from service, and the device may be powered down or
2263 physically removed. In this state, a Printer object MUST NOT produce printed output, and unless the
2264 Printer object is realized by a print server that is still active, the Printer object MUST perform no other
2265 operations requested by a client, including returning this value. If a Printer object had been printing a
2266 job when it was shutdown, the Printer NEED NOT resume printing that job when the Printer is no
2267 longer shutdown. If the Printer resumes printing such a job, it may leave evidence in the printed
2268 output of such a shutdown, e.g. the part printed before the shutdown may be printed a second time
2269 after the shutdown.
- 2270 **'spool-area-full'**: The limit of persistent storage allocated for spooling has been reached. The Printer is
2271 temporarily unable to accept more jobs. The Printer will remove this value when it is able to accept
2272 more jobs. This value SHOULD be used by a non-spooling Printer that only accepts one or a small
2273 number jobs at a time or a spooling Printer that has filled the spool space.

2274 **'stopped-partly'**: When a Printer object controls more than one output device, this reason indicates that one
 2275 or more output devices are stopped. If the reason is a report, fewer than half of the output devices
 2276 are stopped. If the reason is a warning, fewer than all of the output devices are stopped.

2277 **'stopping'**: The Printer object is in the process of stopping the device and will be stopped in a while. When
 2278 the device is stopped, the Printer object will change the Printer object's state to 'stopped'. The
 2279 'stopping-warning' reason is never an error, even for a Printer with a single output device. When an
 2280 output-device ceases accepting jobs, the Printer will have this reason while the output device
 2281 completes printing.

2282 **'timed-out'**: The server was able to connect to the output device (or is always connected), but was unable to
 2283 get a response from the output device.

2284 **'toner-empty'**: The device is out of toner.

2285 **'toner-low'**: The device is low on toner.

2286 10 New Values for Existing Printer Description Attributes

2287 This section contains those attributes for which additional values are added.

2288 10.1 operations-supported (1setOf type2 enum)

2289 The following "operation-id" values are added in order to support the new operations defined in this document:

2290 **Table 14 – Operation-id assignments**

Value	Operation Name	Reference
0x0032	Cancel-Current-Document	[this-spec] §3.9
0x0033	Cancel-Document	[this-spec] §3.8
0x0034	Get-Document-Attributes	[this-spec] §1.1
0x0035	Get-Documents	[this-spec] §3.6
0x0036	Delete-Document	[this-spec] §3.9
0x0037	Set-Document-Attributes	[this-spec] §3.7
0x0038	Validate-Document	[this-spec] §1.1
0x0039	Create-Document	[this-spec] §3.1
0x003A	Send-Data	[this-spec] §3.2

2291 11 Conformance Requirements

2292 This section specifies the conformance requirements for Printers and clients.

2293 11.1 Printer conformance requirements

2294 In order to conform to this specification, a Printer:

- 2295 1. MUST meet the conformance requirements for Printers specified in [RFC2911].
- 2296 2. MUST support the Create-Job operation as specified in [RFC2911], even though a Printer NEED NOT
 2297 support the Create-Job operation in order to conform to [RFC2911].
- 2298 3. MUST support the Document operations that section 3 REQUIRES a Printer to support.

- 2299 4. MUST support the operation attributes in the Send-Document operation and, if supported, the Send-URI
2300 operation that section 6 REQUIRES a Printer to support.
- 2301 5. MAY support any of the Document Template attributes in Document Creation operations as indicated in
2302 section 7 and MUST NOT support them for contexts for where they are not defined as indicated in the Table
2303 9 with an "n".
- 2304 6. MUST support the Document Description attributes that section 8 REQUIRES a Printer to support.
- 2305 7. MUST support the Printer attributes that section 8.2.1 REQUIRES a Printer to support.
- 2306 8. MUST support the values of Printer Descriptions attribute that section 10 REQUIRES a Printer to support.

2307 11.2 Client conformance requirements

2308 In order to conform to this specification, a client:

- 2309 1. MUST meet the conformance requirements for clients specified in [RFC2911]
- 2310 2. MAY support any of the Document operations defined in section 3.
- 2311 3. MUST supply the operation attributes that section 6 REQUIRES a client to supply in operation requests.
- 2312 4. MUST supply any Document Template attributes in the format that section 7 REQUIRES a client to supply in
2313 Document Creation operations and MUST NOT support them for contexts for where they are not defined as
2314 indicated in the Table 9 with an "n".
- 2315 5. SHOULD support any of the Document Description attributes that section 8 REQUIRES a Printer to support.
- 2316 6. MAY support any of the Printer attributes listed in section 8.2.1.
- 2317 7. MAY support any of the values of the Printer Descriptions attributes in section 10.

2318 12 Normative References

2319 Note: The references in the body of this IEEE-ISTO document use the more reader-friendly mnemonic symbols
2320 below, rather than the RFC number (except for [RFC2910] and [RFC2911]). IETF RFCs and IANA registrations
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2353 ISTO 5100.4-2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf>.
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2355 Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1", IEEE-ISTO
2356 5100.3-2001, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>.
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2400 Device Administrative Operations", RFC 3239, February 2002.

2401 14 IANA Considerations

2402 This section contains the registration information for IANA to add to the various IPP Registries according to the
 2403 procedures defined in RFC 2911 [RFC2911] section 6 to cover the definitions in this document. The resulting
 2404 registrations will be published in the <http://www.iana.org/assignments/ipp-registrations> registry.

2405 *Note to the RFC Editor: Replace the References below with the RFC number for the appropriate document,*
 2406 *so that it accurately reflects the content of the information for the IANA Registry.*

2407 14.1 Attribute Registrations

2408 The following table lists all the attributes defined in this document. These are to be registered according to the
 2409 procedures in RFC 2911 [RFC2911] section 6.2.

2410	Attribute Name (attribute syntax):	Reference:	Section:
2411	Document Description attributes:	Reference:	Section:
2412	attributes-charset (charset)	[this spec]	8.2.1
2413	attributes-natural-language (naturalLanguage)	[this spec]	8.2.2
2414	compression (type3 keyword)	[this spec]	8.2.3
2415	current-page-order (type2 keyword)	[this spec]	8.2.4
2416	date-time-at-completed (dateTime)	[this spec]	8.2.5
2417	date-time-at-creation (dateTime)	[this spec]	8.2.6
2418	date-time-at-processing (dateTime)	[this spec]	8.2.7
2419	detailed-status-message (1setOf text (MAX))	[this spec]	4.3.10
2420	document-access-errors (1setOf text(MAX))	[this spec]	4.3.11
2421	document-format (mimeType)	[this spec]	8.2.8
2422	<u>document-format-detail (collection)</u>		8.2.9
2423	document-format (mimeType)	[this spec]	8.2.9.1
2424	document-format-version (text(127))	[this spec]	8.2.9.2
2425	document-format-natural-languages (1setOf naturalLanguage)	[this spec]	8.2.9.3
2426	platform (type3 keyword name(MAX))	[this spec]	8.2.9.4
2427	device-id (text(127))	[this spec]	8.2.9.5
2428	document-format-details (1setOf collection)	[this spec]	8.2.9.6
2429	<u>document-format-detected (mimeType)</u>		8.2.10
2430	document-id-uri (uri)	[this spec]	8.2.11
2431	document-message (text(MAX))	[this spec]	8.2.12
2432	document-name (name(MAX))	[this spec]	8.2.13
2433	document-natural-language (naturalLanguage)	[this spec]	8.2.14
2434	document-number (integer(0:MAX))	[this spec]	8.2.15
2435	document-state (type1 enum)	[this spec]	8.2.16
2436	document-state-message (text(MAX))	[this spec]	8.2.17
2437	document-state-reasons (1setOf type2 keyword)	[this spec]	8.2.18
2438	document-uri (uri)	[this spec]	8.2.19
2439	impressions (integer(0:MAX))	[this spec]	8.2.24
2440	impressions-completed (integer(0:MAX))	[this spec]	8.2.25
2441	impressions-completed-current-copy	[this spec]	8.2.20

2444	(integer(0:MAX))		
2445	job-printer-uri (uri)	[this spec]	8.2.32
2446	k-octets (integer(0:MAX))	[this spec]	8.2.26
2447	k-octets-processed (integer(0:MAX))	[this spec]	8.2.27
2448	last-document (boolean)	[this spec]	8.2.35
2449	media-sheets (integer(0:MAX))	[this spec]	8.2.28
2450	media-sheets-completed (integer(0:MAX))	[this spec]	8.2.29
2451	more-info (uri)	[this spec]	8.2.30
2452	printer-up-time (integer (1:MAX))	[this spec]	8.2.31
2453	sheet-completed-copy-number (integer(0:MAX))	[this spec]	8.2.37
2454	time-at-completed (integer (MIN:MAX))	[this spec]	8.2.38
2455	time-at-creation (integer (MIN:MAX))	[this spec]	8.2.39
2456	time-at-processing (integer (MIN:MAX))	[this spec]	8.2.40
2457	warnings-count (integer(0:MAX))	[this spec]	8.2.34
2458			
2459			
2460	Document Templates attributes:	Reference:	Section:
2461	copies (integer(1:MAX))	[RFC2911]	4.2.5
2462	cover-back (collection)	[prod-print]	3.1
2463	media (type3 keyword name(MAX))	[prod-print]	3.1.1
2464	media-col (collection)	[prod-print]	3.1.1
2465	cover-front (collection)	[prod-print]	3.1
2466	cover-type (type2 keyword)	[prod-print]	3.1.2
2467	media (type3 keyword name(MAX))	[prod-print]	3.1.1
2468	media-col (collection)	[prod-print]	3.1.1
2469	cover-type (type2 keyword)	[prod-print]	3.1.2
2470	finishings (lsetOf type2 enum)	[RFC2911]	4.2.6
2471		[finish]	2
2472	finishings-col (collection)	[prod-print]	3.2
2473	finishing-template (name(MAX))	[prod-print]	3.2.1
2474	stitching (collection)	[prod-print]	3.2.2
2475	stitching-locations (lsetOf integer(0:MAX))	[prod-print]	3.2.2.3
2476	stitching-offset (integer (0:MAX))	[prod-print]	3.2.2.2
2477	stitching-reference-edge (type2 keyword)	[prod-print]	3.2.2.1
2478	force-front-side (lsetOf integer(1:MAX))	[prod-print]	3.3
2479	imposition-template (type2 keyword name(MAX))	[prod-print]	3.4
2480	insert-sheet (lsetOf collection)	[prod-print]	3.5
2481	insert-after-page-number (integer(0:MAX))	[prod-print]	3.5.1
2482	insert-count (integer(0:MAX))	[prod-print]	3.5.2
2483	media (type3 keyword name(MAX))	[prod-print]	3.5.3
2484	media-col (collection)	[prod-print]	3.5.3
2485	media (type3 keyword name(MAX))	[RFC2911]	4.2.11
2486	media-col (collection)	[prod-print]	3.13
2487	media-back-coating (type3 keyword	[prod-print]	3.13.10
2488	name(MAX))		
2489	media-color (type3 keyword name(MAX))	[prod-print]	3.13.4

2490	media-front-coating (type3 keyword	[prod-print]	3.13.10
2491	name(MAX))		
2492	media-hole-count (integer(0:MAX))	[prod-print]	3.13.6
2493	media-info (text(255))	[prod-print]	3.13.3
2494	media-key (type3 keyword name(MAX))	[prod-print]	3.13.1
2495	media-order-count (integer(1:MAX))	[prod-print]	3.13.7
2496	media-preprinted (type3 keyword name(MAX))	[prod-print]	3.13.5
2497	media-recycled (type3 keyword name(MAX))	[prod-print]	3.13.11
2498	media-size (collection)	[prod-print]	3.13.8
2499	x-dimension (integer(0:MAX))	[prod-print]	3.13.8.1
2500	y-dimension (integer(0:MAX))	[prod-print]	3.13.8.2
2501	media-type (type3 keyword name(MAX))	[prod-print]	3.13.2
2502	media-weight-metric (integer(0:MAX))	[prod-print]	3.13.9
2503	media-input-tray-check (type3 keyword	[prod-print]	3.14
2504	name(MAX))		
2505	number-up (integer(1:MAX))	[RFC2911]	4.2.9
2506	orientation-requested (type2 enum)	[RFC2911]	4.2.10
2507	output-bin (type2 keyword name(MAX))	[output-bin]	2.1
2508	page-delivery (type2 keyword)	[prod-print]	3.15
2509	page-order-received (type2 keyword)	[prod-print]	3.16
2510	page-overrides (1setOf collection)	[override]	5.2
2511	document-copies (1setOf rangeOfInteger(MAX))	[override]	5.2.3
2512	input-documents (1setOf rangeOfInteger(MAX))	[override]	5.2.1
2513	output-documents (1setOf rangeOfInteger(MAX))	[override]	5.2.2
2514	pages (1setOf rangeOfInteger(MAX))	[override]	5.2.4
2515	<any other Job Template attributes that		
2516	affect pages, such as media or media-col (
2517	page-ranges (1setOf rangeOfInteger(1:MAX))	[RFC2911]	4.2.7
2518	pages-per-subset (1setOf integer(1:MAX))	[prod-print]	5.3
2519	presentation-direction-number-up (type2	[prod-print]	3.17
2520	keyword)		
2521	print-quality (type2 enum)	[RFC2911]	4.2.13
2522	printer-resolution (resolution)	[RFC2911]	4.2.12
2523	separator-sheets (collection)	[prod-print]	3.18
2524	media (type3 keyword name(MAX))	[prod-print]	3.18.2
2525	media-col (collection)	[prod-print]	3.18.2
2526	separator-sheets-type (type3 keyword	[prod-print]	3.18.1
2527	name(MAX))		
2528	sheet-collate (type2 keyword)	[job-prog]	3.1
2529	sides (type2 keyword)	[RFC2911]	4.2.8
2530	x-image-position (type2 keyword)	[prod-print]	3.19.2
2531	x-image-shift (integer(MIN:MAX))	[prod-print]	3.19.3
2532	x-side1-image-shift (integer(MIN:MAX))	[prod-print]	3.19.4
2533	x-side2-image-shift (integer(MIN:MAX))	[prod-print]	3.19.5
2534	y-image-position (type2 keyword)	[prod-print]	3.19.6
2535	y-image-shift (integer(MIN:MAX))	[prod-print]	3.19.7

2536	y-side1-image-shift (integer(MIN:MAX))	[prod-print]	3.19.8
2537	y-side2-image-shift (integer(MIN:MAX))	[prod-print]	3.19.9
2538			
2539	Job Template attributes:	Reference:	Section:
2540	job-copies (integer(1:MAX))	[this spec]	7.1.1
2541	job-cover-back (collection)	[this spec]	7.1.2
2542	<member attributes are the same as "cover-back">		
2543	job-cover-front (collection)	[this spec]	7.1.3
2544	<member attributes are the same as "cover-front">		
2545	job-finishings (1setOf type2 enum)	[this spec]	7.1.4
2546	job-finishings-col (1setOf collection)	[this spec]	7.1.5
2547	<member attributes are the same as "finishings-col">		
2548			
2549	Printer Descriptions:	Reference:	Section:
2550	document-creation-attributes-supported (1setOf type2 keyword)		
2551		[this spec]	9.1
2552			
2553	Operation attributes:	Reference:	Section:
2554	document-mandatory-attributes (1setOf type2 keyword)	[this spec]	6.2.3
2555			
2556	document-message (text(127MAX))	[this spec]	
2557	3.8.1.1		
2558	input-document-number (integer(1:MAX))	[this spec]	3.1.1.1
2559	job-mandatory-attributes (1setOf type2 keyword)	[this spec]	4.3.2
2560	last-document (boolean)	[this spec]	3.1.1.2
2561			

14.2 Additional Enum Attribute Value Registrations

The following table lists all the new enum attribute values defined in this document as additional type2 enum values. These are to be registered according to the procedures in RFC 2911 [RFC2911] section 6.1.

Value	Name	Reference	Section:
-----	-----	-----	-----
document-state (type1 enum)		[this spec]	§8.2.16
3 pending		[this spec]	§8.2.16
5 processing		[this spec]	§8.2.16
7 canceled		[this spec]	§8.2.16
8 aborted		[this spec]	§8.2.16
9 completed		[this spec]	§8.2.16
job-finishings (1setOf type2 enum)		[this spec]	§7.1.4
<enum values are the same as "finishings">			
operations-supported (type2 enum):			
0x0032	Cancel Current Document	[this spec]	§3.9
0x0033	Cancel-Document	[this-spec]	§3.8

2581	0x0034	Get-Document-Attributes	[this-spec]	§1.1
2582	0x0035	Get-Documents	[this-spec]	§3.6
2583	0x0036	Delete-Document	[this-spec]	§3.9
2584	0x0037	Set-Document-Attributes	[this-spec]	§3.7
2585	0x0038	Validate-Document	[this-spec]	§1.1
2586	0x0039	Create-Document	[this-spec]	§3.1
2587	0x003A	Send-Data	[this-spec]	§3.2

2588 14.3 Operation Registrations

2589 The following table lists all of the operations defined in this document. These are to be registered according to the
 2590 procedures in RFC 2911 [RFC2911] section 6.4.

2592	Operations:	Reference:	Section:
2593	Cancel-Current-Document	[this-spec]	§3.9
2594	Cancel-Document	[this-spec]	§3.8
2595	Get-Document-Attributes	[this-spec]	§1.1
2596	Get-Documents	[this-spec]	§3.6
2597	Delete-Document	[this-spec]	§3.9
2598	Set-Document-Attributes	[this-spec]	§3.7
2599	Validate-Document	[this-spec]	§1.1
2600	Create-Document	[this-spec]	§3.1
2601	Send-Data	[this-spec]	§3.2
2602			

2603 15 Internationalization Considerations

2604 The internationalization considerations for this extension for handling the Document object are the same as for
 2605 handling the Job object in [RFC2911].

2606 16 Security Considerations

2607 The Document object should provide no more increased security considerations than the Job object. The Printer
 2608 MUST provide the same access control for Document objects as for Job objects.

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2632 **20 Appendix A: Document operations compared to Job operations**

2633 This appendix compares the Document operations with the existing Job operations to show the parallelism.

2634 Table 15 compares the Job and Document operations. The two Conf. columns indicate the conformance
 2635 requirements (REQUIRED = REQ, OPTIONAL = OPT) for the Job and Document operations respectively. A "REQ"
 2636 in the Document Conformance column means if the Document object is supported. Whether a Document operation
 2637 is a method on the Job object or the Document object depends on the modeling regime and is not an essential part
 2638 of the semantics described here, since these semantics are intended to apply to both to object-oriented and object-
 2639 based protocols, APIs, and implementations.

2640 **Table 15 - Document operations compared to Job operations**

Job operations	Job Conf.	Document operations	Doc Conf
Cancel-Current-Job	OPT	Cancel-Current-Doc <i>N/A, can only cancel a document explicitly by document number and explicit job id.</i>	OPT
Cancel-Job	REQ	Cancel-Doc	REQ
Create-Job	OPT	Create-Doc	REQ
Get-Job-Attributes	REQ	Get-Doc-Attributes	REQ
Get-Jobs	REQ	Get-Docs	REQ
Hold-Job		<i>N/A, can only hold an entire job.</i>	
Print-Job	REQ	Send-Doc (existing operation - see [RFC2911] with an additional Document attributes group defined in section 3.3)	REQ ⁴⁸

⁴⁸ The Send-Doc operation is OPTIONAL for a Printer to conform to [RFC2911], but is REQUIRED for a Printer to conform to this Document object specification.

Job operations	Job Conf.	Document operations	Doc Conf
Print-URI	OPT	Send-URI (existing operation - see [RFC2911] with an additional Document attributes group defined in section 3.4)	OPT
<i>N/A</i>		Send-Data	REQ
Promote-Job	OPT	<i>N/A, can only promote an entire job</i>	
Purge-Jobs	OPT	Delete-Document	OPT
Release-Held-New-Jobs	OPT	<i>N/A, can only release entire jobs</i>	
Release-Job	OPT	<i>N/A, can only release an entire job</i>	
Reprocess-Job	OPT	<i>N/A, can only reprocess an entire job</i>	
Restart-Job	OPT	<i>N/A, can only restart an entire job</i>	
Resume-Job	OPT	<i>N/A, can only resume an entire job</i>	
Schedule-Job-After	OPT	<i>N/A, can only schedule an entire job</i>	
Set-Job-Attributes	OPT	Set-Document-Attributes	OPT
Suspend-Current-Job	OPT	<i>N/A, can only suspend an entire job in order to run another one</i>	
Validate-Job	REQ	Validate-Document <i>N/A, use Validate-Job to validate a single document or use Create-Job with "ipp-attribute-fidelity" = 'true' and Create-Document request to validate a multi-document job.</i>	REQ

2641
2642

2643 **21 Annex B: Change Log (informative)**

- 2644 Version 0.6, 13 January 2003, agreements from New Orleans October PWG meeting and subsequent telecons:
- 2645 1. Deleted the Cancel-Current-Documents and Validate-Document operations.
 - 2646 2. Deprecated the "input-document-number" operation attribute from the Document Creation operations.
 - 2647 3. Deleted the "document-mandatory-attributes" operation attribute to align with the PWG Semantic model. So
 - 2648 both specifications have only the "job-mandatory-attributes" operation attribute. The client can only supply at
 - 2649 the Job Level. The Document Level inherits from the Job Level.
 - 2650 4. Increased "document-message" operation attribute length from 127 to MAX (1023) octets.
 - 2651 5. Clarified that "ipp-attribute-fidelity" and "job-mandatory-attributes" can only be supplied at the Job Level; the
 - 2652 Document level inherits their values.
 - 2653 6. Added "ipp-attribute-fidelity" and "job-mandatory-attributes" Job Description attributes.
 - 2654 7. Added the "media-size-name" as a member attribute of "media-col" and as a separate Job Template attribute
 - 2655 as used by UPnPv1 and UPnPv2.
 - 2656 8. Added the "media-type" as a Job and Document Template attribute on its own as used by UPnPv1 and
 - 2657 UPnPv2 (as well as leaving it as a member attribute of the "media-col" Job and Document Template
 - 2658 attributes).
 - 2659 9. Renamed "document-printer-up-time" Document Description attribute to simply "printer-up-time".
 - 2660 10. Added the following Job Description attributes: "ipp-attribute-fidelity", and "job-mandatory-attributes".
 - 2661 11. Removed the following Document Description attributes: "ipp-attribute-fidelity".
 - 2662 12. Added the following Document Description attributes: "document-format-detail", "document-format-detected",
 - 2663 "job-id", "job-printer-uri", "job-uri", "output-device-assigned".
 - 2664 13. Defined all of the Document Description attributes, often with references to other specifications, so that they
 - 2665 appear in the table of contents.

- 2667 Version 0.5, 25 October 2002, as a result of the PWG Semantic Model telecon, October 24, 2002:
- 2668 1. Fixed the title to say "Proposed Standard" and removed the 5100.n number until the document is approved
 - 2669 by the PWG Last Call to progress as a Draft Standard.
 - 2670 2. Changed Cancel-Document from OPTIONAL to REQUIRED.

3. Added Table 3 and Table 4 to show the request and response signatures of the Document Creation and Validation operations.
4. Renamed the "document-number" operation attribute to "input-document-number", to agree with [override] and because the Document object is really the Input Document (as opposed to the Output Document). The Printer copies this value to the Document's "document-number" Document Description attribute.
5. Clarified that the Printer MUST reject a Create-Document request if the "document-number" already exists.
6. Clarified that the client cannot supply Subscription attributes in any Document Creation requests.
7. Added "document-message" (text(127)) operation attribute to the Document Creation requests to go with the "document-message" agreement (see point #15).
8. Fixed Create-Document response to return Job status attributes in Group 3 and Document status attributes in Group 4.
9. Required the Printer to return just the "document-number" and "document-id-uri" (uri) Document Description attribute in a Document Creation response.
10. Added the "document-mandatory-attributes" operation attribute.
11. Separated the returned Job status attributes and the Document status attributes into two groups, one Job Attributes and the other Document attributes.
12. Allowed the client to supply or omit the "document-uri" operation attribute in a Validate-Job request.
13. Clarified that the "document-number" operation attribute MUST follow the Printer and Job Target in Group 1.
14. Changed the Get-Documents response when there is no "requested-attributes" to simply "document-number" and "document-id-uri" to be parallel with the Get-Jobs operation.
15. Changed the "message" operation attribute in Cancel-Document and Cancel-Current-Document to "document-message" operation attribute which the Printer copies to the "document-message" Document Description attribute for use both by the user and the operator.
16. Clarified that the "document-state-reasons" values never affect Job scheduling.
17. Made Job Level - page override programming higher precedence than Document level Document object attributes.
18. Clarified PDL document data precedence and its relationship to Job Template attributes ending with "-requested".
19. In Table 6, flagged the operation attributes that the Printer copies to the corresponding Job and Document Description attributes in Document Creations operations.
20. Fixed "job-mandatory-attributes" operation attribute so its only supplied at Job level, now that we have "document-mandatory-attributes" operation attribute.
21. Clarified that "ipp-attribute-fidelity" can be supplied at both the Job and Document Levels and how it interacts with "job-mandatory-attributes" and "document-mandatory-attributes" operation attributes.
22. Disallowed "output-bin" at the Document Level (and Page Level). It subsets the single stream of Input-Pages across Input-Documents.
23. Disallowed "page-ranges" at the Page Level.
24. Disallowed "pages-per-subset" at the Document level (and Page Level).
25. Disallowed "separator-sheets" at the Page Level.
26. Added "document-printer-up-time" Document Description attribute for Get-Documents and Get-Document-Attributes responses that the Printer MUST support, just like "job-printer-up-time" operation attribute for Get-Jobs and Get-Job-Attributes.

Version 0.4, 14 October 2002:

1. Added the operation specifications.
2. Added the Create-Document and Send-Data to be more parallel with Jobs and support PWG PSI.
3. Resolved the 15 issues in version 0.3 as discussed on the mailing list.
4. Added the Attribute Precedence section 5.
5. Added [prod-print2] attributes.
6. Added job-mandatory-attributes, job-cover-back, job-cover-front, job-copies, job-finishings, job-finishings-col, document-id-uri, and redirect-uri.

Version 0.3, 9 September 2002:

1. Reformatted as an IEEE-ISTO standard and added the usual sections for a standard.
2. Added "original-requesting-user-name" Operation attribute to Table 6.

- 2726 3. Added "y" to "output-bin" in Table 8 so it MAY be a Document Template attribute.
- 2727 4. Clarified the * and ** in Table 9 - Job and Document Description attributes.
- 2728 5. Added section 8.2.1 all of the Printer attributes defined In any IPP standard.
- 2729 6. Allocated operation-id enums in section 10 to the 7 Document operations.
- 2730 7. Added the conformance section 11
- 2731 8. Completed the IANA Considerations section 14.
- 2732
- 2733