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5 # The Printer Working Group (PWG)

6 ## Proposed Standard for

7 Internet Printing Protocol (IPP):

8 "-actual" attributes ~~extension~~

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23 ~~18 October~~Version 0.2, December 5, 2002

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The Printer Working Group (PWG)
Proposed Standard for
Internet Printing Protocol (IPP):
"-actual" attributes extension

Version 0.2, December 5, 2002

Abstract: This document defines an extension to the Internet Printing Protocol/1.0 (IPP/1.0) [RFC2566, RFC2565] & IPP/1.1 [RFC2911, RFC2910] for the OPTIONAL "-actual" set of Job Description attributes that correspond to Job Template attributes defined in IPP. These "-actual" attributes allow the client to determine the true results of a print job regardless of what was specified in the Create-Job or Print-Job operation.

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

ftp://ftp.pwg.org/pub/pwg/ipp/new_ACT/pwg-ippIPP-actual-attrsibutes -v02-021205.pdf, .doc

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

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62 Title: The Printer Working Group Standard for the Internet Printing Protocol (IPP): "-actual" attributes ~~extension~~

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91 **About the IEEE-ISTO PWG**

92 The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and Technology Organization
93 (ISTO) with member organizations including printer manufacturers, print server developers, operating system
94 providers, network operating systems providers, network connectivity vendors, and print management application
95 developers. The group is chartered to make printers and the applications and operating systems supporting them
96 work together better. All references to the PWG in this document implicitly mean "The Printer Working Group, a
97 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open
98 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
99 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
100 standards.

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

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

105 **Contact information:**

106   IPP Web Page: http://www.pwg.org/ipp/
107   IPP Mailing List: ipp@pwg.org

108 To subscribe to the ipp mailing list, send the following email:
109   1) send it to majordomo@pwg.org
110   2) leave the subject line blank
111   3) put the following two lines in the message body:
112   subscribe ipp
113   end
114
115 Implementers of this specification are encouraged to join the IPP Mailing List in order to participate in any
116 discussions of clarifications or review of registration proposals for additional names. Requests for additional media
117 names, for inclusion in this specification, should be sent to the IPP Mailing list for consideration.

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163 **1 Introduction**

164 This document specifies an extension to the Internet Printing Protocol/1.0 (IPP) [RFC2565, RFC2566] and IPP/1.1
165 [RFC2910, RFC2911]. This extension consists of a set of OPTIONAL Job Description attributes that correspond to
166 the set of Job Template attributes defined in IPP. Specifically, for each Job Template attribute, there is a
167 corresponding "-actual" attribute that reports the value that was actually used, or will be used, in the processing of the
168 job. As an example, along with the "copies" Job Template attribute would be the new "copies-actual" Job Description
169 attribute, which would have a value corresponding to the actual number of copies of the job that were printed (or are
170 going to print).

171 These attributes permit an IPP Printer to report much more accurate status to an IPP client. There are two aspects
172 to this. First, These attributes ultimately allow the client canto determine the true results of a print job regardless of
173 what was specified in the Create-Job or Print-Job operation. But second, a client can often find out *in advance* what
174 the true results are expected to be; for example, it can tell a user "Copy 3 of 7" rather than simply "Copy 3".

175 Similarly, the "-actual" concept extends to Document Template attributes as well; that is, for each Document
176 Template attribute, there is a corresponding "-actual" Document Description attribute. Document Template and
177 Document Description attributes are part of the Document Object extension to IPP that is specified in [docobj].

178 These new attributes are OPTIONAL for a Printer to support, and are OPTIONAL for a client to use.

179 **1.1 Problem**

180 In IPP/1.0 and IPP/1.1, it is possible for a client to request specific job processing behavior, through the use of the
181 Job Template attributes. Some examples of Job Template attributes are "copies", "sides", and "media". The client
182 specifies these attributes in the Jjob Ccreation operation—for example, the Print-Job operation. It is also possible to
183 query the values of those Job Template attributes, using, for example, the Get-Job-Attributes operation. Note that
184 the value returned in a query is always the same as the value that was specified on the Jjob Ccreation operation.

185 It is also possible for a Printer to state, uUsing the "pdl-override-supported" Printer Description attribute, it is possible
186 for awhether the Printer to indicate that it will attempt to override any instructions in the PDL with the values given by
187 the Job Template attributes. Imagine a job that was submitted with Job Template attribute "copies" set to 5, but the
188 actual PDL contained in the job specified 3 copies. A Printer that supports PDL override (that is, returns a value of
189 'attempted' for the "pdl-override-supported" attribute) promises to attempt to print that job with 5 copies rather than 3.

190 Thus, while IPP defines and facilitates aPutting the above facts together, there is a well-defined case where the client
191 can request a number of copies through the "copies" attribute and be somewhat confident that the request will be
192 honored,.

193 However, in practice, this case is not necessarily the most prevalent case.

194 First, many clients either do not or cannot specify the Job Template attributesinstructions themselves. As an
195 example, a client integrated into the Windows print subsystem must be either, in Windows terms, a print provider or a
196 print monitor. Neither of these components in the print subsystem have GUIs set up for the user to provide
197 processing behavior requests. Instead, in Windows, these requests are typically made through the print driver and
198 therefore embedded in the PDL of the job.

199 Similarly, many Printers do not support PDL override, possibly due to architecture constraints or limits based on the
200 capabilities or costsize of the Printer. For such Printers, a Job Template attribute value specified by the client does
201 not necessarily have any correlation with the actual value used; for example, specifying a "copies" value of 3 has
202 absolutely no effect on the number of copies produced.

203 Also note that even when the Printer supports PDL override, this is only an indication that the Printer willit only
204 promises to *attempt* to override. There is no guarantee that the requested value will end up being the "actual" value.

205 Therefore, there is a need for a method to allow clients to find out what actually happened with a job: Did it actually
206 print 5 copies?

207 1.2 Solution

208 The solution to this problem is to add a set of Job Description attributes to report these "what actually happened"
209 values. There willwould be one such Job Description attribute for each Job Template attribute. This extends the
210 pregoes along with the already-existing concept that each Job Template attribute has a corresponding "-supported"
211 and "-default" attribute; now there will also be a corresponding "-actual" attribute. These new attributes can be
212 queried using existing operations to retrieve information on what actually happened, or what will actually happen, for
213 a job.

214 1.3 Alternative solutions

215 There are a number of possible solutions to this problem. The solution discussed in this document is considered to
216 be the one with the least impact on the overall architecture of IPP, creating the least churn on the model while
217 providing full support to clients to discover the "actual" processing behavior.

218 Many have remarked that what is being described here is essentially what is currently in the industry being termed a
219 "Job Ticket". Adding full job ticket support to IPP would be beneficial and would solve this problem. However, this
220 effort is expected to be complicated and result in a possibly significant update to the IPP architecture. Also, adding
221 full job ticket support might be too costly for smaller IPP implementations. The solution described here can, then,
222 could be thought of as an inexpensive alternative to a full job ticket solution.

223 1.4 Scope

224 While implementers of this specification may use the "-actual" attributes to perform accounting functions, this
225 specification is intended to address information that is displayed to a human user.

226 2 Terminology

227 This section defines terminology used throughout this document.

228 2.1 Conformance Terminology

229 Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY, NEED NOT,** and
230 **OPTIONAL**, have special meaning relating to conformance as defined in RFC 2119 [RFC2119] and [RFC2911]
231 section 12.1. If an implementation supports the extension defined in this document, then these terms apply;
232 otherwise, they do not. These terms define conformance to *this document (and [RFC2911]) only*; they do not affect
233 conformance to other documents, unless explicitly stated otherwise. To be more specific:

234 **REQUIRED** - an adjective used to indicate that a conforming IPP Printer implementation MUST support the indicated
235 operation, object, attribute, attribute value, status code, or out-of-band value in requests and responses. See
236 [RFC2911] "Appendix A - Terminology for a definition of "support". *Since support of this entire specification is*

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237 *OPTIONAL for conformanc e to IPP/1.1, the use of the term REQUIRED in this document means "REQUIRED if this*
238 *OPTIONAL Document Object specification is implemented".*

239 **RECOMMENDED** - an adjective used to indicate that a conforming IPP Printer implementation is recommended to
240 support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in requests and
241 responses. *Since support of this entire specification is OPTIONAL for conformance to IPP/1.1, the use of the term*
242 *RECOMMENDED in this document means "RECOMMENDED if this OPTIONAL Document Object specification is*
243 *implemented".*

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

247 ~~Capitalized terms, such as **MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY, NEED NOT,** and~~
248 ~~**OPTIONAL**, have special meaning relating to conformance to this specification. These terms are defined in~~
249 ~~[RFC2911 section 13.1 on conformance terminology, most of which is taken from RFC 2119 [RFC2119]. Since~~
250 ~~support of this entire IPP extension specification is OPTIONAL for conformance to IPP/1.0 ([RFC2566], [RFC2565])~~
251 ~~or IPP/1.1 ([RFC2911], [RFC2910]), the terms MUST, MUST NOT, REQUIRED, SHOULD, SHOULD NOT, MAY,~~
252 ~~NEED NOT, and OPTIONAL apply *if and only if the extension specification in this document is implemented.*~~
253 ~~Thus a feature labeled as REQUIRED in this document is not REQUIRED if implementing the basic IPP/1.1 protocol~~
254 ~~defined by [RFC2911] and [RFC2910].~~

255 ## 2.2 Other Terminology

256 This document uses the same terminology as [RFC2911], such as "**client**", "**Printer**", "**attribute**", "**attribute value**",
257 "**keyword**", "**Job Template attribute**", "**Operation attribute**", "**operation**", "**request**", and "**support**" with the same
258 meaning. In addition, terms such as "**Document Object**", "**Document Template attribute**", "**Job Creation**
259 **operation**", and "**Document Creation operation**" are used with the same meaning as they have in [docobj].

260 ~~This glossary defines certain terms used in this specification which may not be generally familiar or which may be~~
261 ~~used with very specific meaning. These definitions are not intended to be absolute but do reflect the use of the terms~~
262 ~~within this specification.~~

263 ~~**IETF** Internet Engineering Task Force. A volunteer group that develops and approves standards that are relative to~~
264 ~~the Internet.~~

265 ~~**ISO** International Organization for Standardization.~~

266 # 3 "-actual" ~~Job Description~~ attributes

267 For each Job Template attribute defined in the IPP Model [RFC2566, RFC2911], or defined in any IPP extension
268 document, a new Job Description attribute is defined. This new attribute will be referred to as an "-actual" attribute,
269 since the name of such attributes is found by taking the name of the Job Template attribute and appending "-actual".
270 The "-actual" attribute is multi-valued, where each value has the same syntax as the corresponding Job Template
271 attribute. For example, the "copies" (integer(1:MAX)) Job Template attribute has a new corresponding "copies-
272 actual" (1setOf integer(1:MAX)) Job Description attribute. Another example is the "media-col" (collection) Job
273 Template attribute, which now has a new corresponding "media-col-actual" (1setOf collection) Job Description
274 attribute, where each value in the 1setOf has the same collection syntax, with the same member attributes, as the
275 "media-col" attribute.

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                                                                          actual" Attributes

276 The only exception to the rule that each value of the "-actual" attribute has the same syntax as the corresponding Job
277 Template attribute is for Job Template attributes that are themselves multi-valued. For example, the "finishings"
278 (1setOf (type2 enum)) attribute has a corresponding "finishings-actual" (1setOf (type2 enum)) attribute that has the
279 same syntax; that is, the syntax is (1setOf (type2 enum)) instead of (1setOf (1setOf (type2 enum))).

280 As with Job Template attributes, for each Document Template attribute defined in [docobj], a new Document
281 Description attribute is defined, whose name is found by appending "-actual" to the Document Template attribute
282 name.

283 These new attributes are OPTIONAL for a Printer to support, and are OPTIONAL for a client to use.

284 Table 1~~Table 1~~ ~~below~~ lists the "-actual" Job Description attributes for all Job Template attributes in existence in
285 approved IPP standard documents as of the date of this document.

286 Many of the Job Template attributes shown in Table 1 are also Document Template attributes—for such attributes,
287 the second column of Table 1 shows the name and type of the corresponding "-actual" Document Description
288 attribute. To know which attributes these are, see [docobj].

289   **Table 1 – "-actual" Job Description attributes**

Job Template Attribute	"-actual" Job Description attribute	Reference
copies (integer(1:MAX))	copies-actual (1setOf integer(1:MAX))	[RFC2911] §4.2.5
cover-back (collection)	cover-back-actual (1setOf (collection))	[PWG5100.3] §3.1
cover-front (collection)	cover-front-actual (1setOf (collection))	[PWG5100.3] §3.1
document-overrides (1setOf collection)	document-overrides-actual (1setOf collection)	[PWG5100.4] §5.1
finishings (1setOf (type2 enum))	finishings-actual (1setOf (type2 enum)	[RFC2911] §4.2.6 and [PWG5100.1] §2
finishings-col (collection)	finishings-col-actual (1setOf (collection))	[PWG5100.3] §3.2
force-front-side (1setOf integer(1:MAX))	force-front-side-actual (1setOf (1setOf integer(1:MAX)))	[PWG5100.3] §3.3
imposition-template (type3 keyword	name(MAX))	imposition-template-actual (1setOf (type3 keyword	name(MAX)))	[PWG5100.3] §3.4
insert-sheet (collection)	insert-sheet-actual (1setOf (collection))	[PWG5100.3] §3.5
job-account-id (name(MAX))	job-account-id-actual (1setOf (name(MAX)))	[PWG5100.3] §3.6
job-accounting-sheets (collection)	job-accounting-sheets-actual (1setOf (collection))	[PWG5100.3] §3.8
job-accounting-user-id (name(MAX))	job-accounting-user-id-actual (1setOf (name(MAX)))	[PWG5100.3] §3.7
job-error-sheet (collection)	job-error-sheet-actual (1setOf (collection))	[PWG5100.3] §3.9
job-hold-until (type3 keyword | name)	job-hold-until-actual (1setOf (type3 keyword | name))	[RFC2911] §4.2.2
job-message-to-operator (text(MAX))	job-message-to-operator-actual (1setOf (text(MAX)))	[PWG5100.3] §3.10
job-priority (integer(1:100))	job-priority-actual (1setOf integer(1:100))	[RFC2911] §4.2.1
job-sheets (type3 keyword | name)	job-sheets-actual (1setOf (type3 keyword | name))	[RFC2911] §4.2.3
job-sheets-col (collection)	job-sheets-col-actual (1setOf (collection))	[PWG5100.3] §3.11
job-sheet-message (text(MAX))	job-sheet-message-actual (1setOf (text(MAX)))	[PWG5100.3] §3.12
media (type3 keyword	name(MAX))	media-actual (1setOf (type3 keyword	name(MAX)))	[RFC2911] §4.2.11
media-col (collection)	media-col-actual (1setOf (collection))	[PWG5100.3] §3.13
media-input-tray-check (type3 keyword	name(MAX))	media-input-tray-check-actual (1setOf(type3 keyword	name(MAX)))	[PWG5100.3] §3.14

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Job Template Attribute	"-actual" Job Description attribute	Reference
multiple-document-handling (type2 keyword)	multiple-document-handling-actual (1setOf (type2 keyword))	[RFC2911] §4.2.4
number-up (integer(1:MAX))	number-up-actual (1setOf integer(1:MAX))	[RFC2911] §4.2.9
orientation-requested (type2 enum)	orientation-requested-actual (1setOf (type2 enum))	[RFC2911] §4.2.10
output-bin (type2 keyword	name(MAX))	output-bin-actual (1setOf (type2 keyword	name(MAX)))	[PWG5100.2] §2.1
page-delivery (type2 keyword)	page-delivery-actual (1setOf (type2 keyword))	[PWG5100.3] §3.15
page-order-received (type2 keyword)	page-order-received-actual (1setOf (type2 keyword))	[PWG5100.3] §3.16
page-overrides (1setOf collection)	page-overrides-actual (1setOf collection)	[PWG5100.4] §5.2
page-ranges (1setOf rangeOfInteger(1:MAX))	page-ranges-actual (1setOf rangeOfInteger(1:MAX))	[RFC2911] §4.2.7
pages-per-subset (1setOf integer)	pages-per-subset-actual (1setOf integer)	[PWG5100.4] §5.3
~~P~~presentation-direction-number-up (type2 keyword)	Presentation-direction-number-up-actual (1setOf(type2 keyword))	[PWG5100.3] §3.17
print~~er~~-quality (type2 enum)	print~~er~~-quality-actual (1setOf (type2 enum))	[RFC2911] §4.2.13
printer-resolution (resolution)	printer-resolution-actual (1setOf resolution)	[RFC2911] §4.2.12
separator-sheets (collection)	~~s~~Separator-sheets-actual (1setOf (collection))	[PWG5100.3] §3.18
sheet-collate (type2 keyword)	sheet-collate-actual (1setOf (type2 keyword))	[RFC3381] §3.1
sides (type2 keyword)	sides-actual (1setOf (type2 keyword))	[RFC2911] §4.2.8
x-image-position (type2 keyword)	x-image-position-actual (1setOf (type2 keyword))	[PWG5100.3] §3.19.2
x-image-shift (integer (MIN:MAX))	x-image-shift-actual (1setOf (integer (MIN:MAX)))	[PWG5100.3] §3.19.3
x-side1-image-shift (integer (MIN:MAX))	x-side1-image-shift-actual (1setOf (integer (MIN:MAX)))	[PWG5100.3] §3.19.4
x-side2-image-shift (integer (MIN:MAX))	x-side2-image-shift-actual (1setOf (integer (MIN:MAX)))	[PWG5100.3] §3.19.5
y-image-position (type2 keyword)	y-image-position-actual (1setOf (type2 keyword))	[PWG5100.3] §3.19.6
y-image-shift (integer (MIN:MAX))	y-image-shift-actual (1setOf (integer (MIN:MAX)))	[PWG5100.3] §3.19.7
y-side1-image-shift (integer (MIN:MAX))	y-side1-image-shift-actual (1setOf (integer (MIN:MAX)))	[PWG5100.3] §3.19.8
y-side2-image-shift (integer (MIN:MAX))	y-side2-image-shift-actual (1setOf (integer (MIN:MAX)))	[PWG5100.3] §3.19.9

290

291 Note that Table 1 is not meant to be an exhaustive list of the "-actual" attributes a Printer might implement, as it lists
292 only those attributes in existence in approved IPP standard documents as of the date of this document. For any Job
293 Template or Document Template attributes created by past, present, or future IPP standard documents, this
294 specification states that a corresponding "-actual" Job Description or Document Description exists and can be
295 implemented by a Printer or queried by a client.

296   3.1   Overall philosophy

297 These attributes are to be set on a "best effort" basis by the Printer. It cannot be expected that a Printer that can
298 return a known value for some "-actual" attribute will ~~never~~always return ~~a~~ the 'unknown' value for that attribute.
299 Also, a Printer does not guarantee the accuracy of the value until the job/document has moved to a completion state
300 (job-state/document-state is 'completed', 'canceled', or 'aborted').

301 In the same vein, a client SHOULD be robust in its use of these attributes, being able to handle both when the
302 attribute is unknown and when the attribute changes value, including changing to a value different than that specified
303 by the client. For example, the client might query for job attributes and present the status string "Printed page 2 of 4,
304 Copy 3" since the "copies-actual" attribute was returned as 'unknown'. Then, the very next query it makes might
305 have a~~n updated~~ "copies-actual" value~~attribute~~, since the Printer ha~~d~~s just determined the value, so the next status
306 string presented might be "Printed page 3 of 4, Copy 3 of 6".

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307 3.2   Relationship between "-actual" attributes and Job Template attributes

308 A very important point about the new "-actual" attributes is that support for them is not in any way tied to the support
309 for the corresponding Job/Document Template attributes. For example, a Printer that does not support PDL override
310 will not support the "copies" Job/Document Template attribute either. However, that same Printer SHOULD support
311 the "copies-actual" Job/Document Description attribute if the Printer knows how many copies printed for a
312 job/document.

313 Similarly, the "-actual" attribute's existence is not in any way tied to the existence of the Job Template attribute on the
314 job creation request. Wwhether or not a value for a Job/Document Template attribute was included in the
315 Job/Document Creation operation number of copies was requested, the Printer SHOULD return the corresponding "-
316 actual" attribute port on how many copies actually printed if the value is known.

317 3.3   Timeline of values

318 As with all Job/Document Description attributes, if the value of a supported "-actual" attribute is not yet known for a
319 job, it MUST be returned with the out-of-band 'unknown' value in any query.

320 The value of an "-actual" attribute can change during the processing of a jJob/Document. The most obvious possible
321 change is from 'unknown' to an actual value, but other possibilities exist as well. For example, a Printer might be
322 planning on printing 5 copies of a job, but due to some error or to the job being canceled, the job might only print 3
323 copies. In this case, the "copies-actual" value would start at 5, then change to 3 at the point the Printer determines
324 the final copy count will be 3.

325 A printer that supports a Job/Document Template attribute in such a way that the value of the attribute overrides any
326 instructions in the PDL SHOULD populate the corresponding "-actual" attribute at the time at which it reads the
327 Job/Document Template attribute. On the other hand, for an attribute where the PDL might override the value
328 provided for the Job/Document Template attribute, the Printer SHOULD wait until the PDL has been sufficiently
329 processed to determine the true value of the "-actual" attribute before populating it. If a Printer supports PDL override,
330 it SHOULD initialize the "-actual" attribute's value to be the value that was requested for the associated Job Template
331 attribute on the job creation operation.

332 In any case, a Printer MUST NOT return a value that it does not believe is the correct value; that is, even though the
333 Printer can change the value later, it should never "guess" at the value.

334 3.4   Multi-valued

335 All "-actual" attributes are multi-valued. If a certain attribute has more than one value for a jJob/Document, such as a
336 job that prints partly simplex and partly duplex, the Printer SHOULD include all values, in the order they were used.

337 To obtain more fine-grained information, the "page-overrides-actual" and "document-overrides-actual" attributes can
338 be used. For example, the "page-overrides-actual" attribute could be used to report that a job printed page 1 in
339 simplex and the rest of the job in duplex. For more information on the format of these two attributes, see
340 [PWG5100.4].

341 3.5   Existing attributes that are similar to "-actual" attributes

342 There are three existing attributes in IPP that function in a similar way to the new "-actual" attributes: the "job-k-
343 octets", "job-impressions", and "job-media-sheets" attributes. These attributes can be specified as operation
344 attributes of a Job Creation operation, and are also available as Job Description attributes. When queried, the
345 Printer can return the value that was specified in the creation operation, or can return a different value that it has
346 determined to be more accurate. For more information on these attributes, see [RFC2911], §4.3.17 and §3.2.1.1.

4 New attribute group values

To accommodate the ability of a client to query the "-actual" attributes, a new attribute group value is defined for use with the Get-Job-Attributes and Get-Jobs operations. In addition to the existing attribute groups defined in [RFC2911] §3.3.4, the following attribute group value is now defined:

- 'job-actual': the subset of the "-actual" Job Description attributes specified in this document that the implementation supports for Job objects.

A Printer MUST support the 'job-actual' keyword.

Similarly, a new attribute group value is defined for use with the Get-Document-Attributes and Get-Documents operations. In addition to the existing attribute groups defined in [docobj] §3.6, the following attribute group value is now defined:

- 'document-actual': the subset of the "-actual" Document Description attributes specified in this document that the implementation supports for Document objects.

A Printer that supports the Document Object MUST support the 'document-actual' keyword.

45 Conformance Requirements

A printer SHOULD support an "-actual" attribute if it knows the value through any means, such as through the value of the corresponding Job/Document Template attribute, through the value specified on an IPP "Set" operation [RFC3380], through the PDL, or through some means external to IPP or the PDL.

Any support for the "-actual" attributes is OPTIONAL for both Printers and clients, and any subset of the attributes can be supported. To conform to this specification, a Printer or client MUST comply with the descriptions in sections 3 and 4 above.

Although a number of optional extensions to IPP are referred to in this document, support for those extensions is not required in order to support the "-actual" attributes extension defined in this specification. For example, although this specification defines new Document Description attributes to go along with the Document Template attributes defined in the Document Object optional extension to IPP, a Printer or client could implement or use "-actual" attributes without implementing the Document object.

56 Security Considerations

This specification will have no impact on the security burden of or potential threats to the importing system.

374 # 67   References

375 ## 7.1   Normative References

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379 [PWG5100.2]
380   Hastings, T., and R. Bergman, "Internet Printing Protocol (IPP): output-bin attribute extension", IEEE-ISTO
381   5100.2-2001, February 7, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf. <work in progress>.

382 [PWG5100.3]
383   Ocke, K., and T. Hastings, "Internet Printing Protocol (IPP): Production Printing Attributes – Set 1", IEEE-
384   ISTO 5100.3-2001, February 12, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf<work in
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386 [PWG5100.4]
387   Herriot, R., and K. Ocke, "Internet Printing Protocol (IPP): Override Attributes for Documents and Pages",
388   IEEE-ISTO 5100.4-2001, February 7, 2001, ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.4.pdf<work in
389   progress>.

390 [RFC2119]
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392 [RFC2565]
393   Herriot, R., Butler, S., Moore, P. and R. Turner, "Internet Printing Protocol/1.0: Encoding and Transport",
394   RFC 2565, April 1999.

395 [RFC2566]
396   deBry, R., Hastings, T., Herriot, R., Isaacson, S. and P. Powell, "Internet Printing Protocol/1.0: Model and
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398 [RFC2910]
399   Herriot, R., Butler, S., Moore, P., Turner, R. and J. Wenn, "Internet Printing Protocol/1.1: Encoding and
400   Transport", RFC 2910, September 2000.

401 [RFC2911]
402   Hastings, T., Herriot, R., deBry, R., Isaacson, S. and P. Powell, "Internet Printing Protocol/1.1: Model and
403   Semantics", RFC 2911, September 2000.

404 [RFC3380]
405   Hastings, T., Herriot, R., Kugler, C. and H. Lewis, "Internet Printing Protocol (IPP): Job and Printer Set
406   Operations", RFC 3380, September 2002.

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407 [RFC3381]
408   Hastings, T., Lewis, H., and R. Bergman, "Internet Printing Protocol (IPP): Job Progress Attributes", RFC
409   3381, September 2002.

7.2   Informative references

411 [docobj]
412   Hastings, T., and P. Zehler, "Internet Printing Protocol (IPP): Document Object", ", to become a PWG IEEE-
413   ISTO standard, work in progress, October 25, 2002, ftp://ftp.pwg.org/pub/pwg/ipp/new_DOC/pwg-ipp-
414   document-object-v05-021025.pdf

8   IANA Considerations

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

8.1   Attribute Registrations

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

```
422 Job Description attributes:
423 copies-actual (1setOf integer(1:MAX))
424 cover-back-actual (1setOf (collection))
425 cover-front-actual (1setOf (collection))
426 document-overrides-actual (1setOf collection)
427 finishings-actual (1setOf (type2 enum))
428 finishings-col-actual (1setOf (collection))
429 force-front-side-actual (1setOf (1setOf integer(1:MAX)))
430 imposition-template-actual (1setOf (type3 keyword | name(MAX)))
431 insert-sheet-actual (1setOf (collection))
432 job-account-id-actual (1setOf (name(MAX)))
433 job-accounting-sheets-actual (1setOf (collection))
434 job-accounting-user-id-actual (1setOf (name(MAX)))
435 job-error-sheet-actual (1setOf (collection))
436 job-hold-until-actual (1setOf (type3 keyword | name))
437 job-message-to-operator-actual (1setOf (text(MAX)))
438 job-priority-actual (1setOf integer(1:100))
439 job-sheets-actual (1setOf (type3 keyword | name))
440 job-sheets-col-actual (1setOf (collection))
441 job-sheet-message-actual (1setOf (text(MAX)))
442 media-actual (1setOf (type3 keyword | name(MAX)))
443 media-col-actual (1setOf (collection))
444 media-input-tray-check-actual (1setOf (type3 keyword | name(MAX)))
445 multiple-document-handling-actual (1setOf (type2 keyword))
446 number-up-actual (1setOf integer(1:MAX))
447 orientation-requested-actual (1setOf (type2 enum))
448 output-bin-actual (1setOf (type2 keyword | name(MAX)))
449 page-delivery-actual (1setOf (type2 keyword))
450 page-order-received-actual (1setOf (type2 keyword))
```

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```
451  page-overrides-actual (1setOf collection)
452  page-ranges-actual (1setOf rangeOfInteger(1:MAX))
453  pages-per-subset-actual (1setOf integer)
454  presentation-direction-number-up-actual (1setOf (type2 keyword))
455  print-quality-actual (1setOf (type2 enum))
456  printer-resolution-actual (1setOf resolution)
457  separator-sheets-actual (1setOf (collection))
458  sheet-collate-actual (1setOf (type2 keyword))
459  sides-actual (1setOf (type2 keyword))
460  x-image-position-actual (1setOf (type2 keyword))
461  x-image-shift-actual (1setOf (integer (MIN:MAX)))
462  x-side1-image-shift-actual (1setOf (integer (MIN:MAX)))
463  x-side2-image-shift-actual (1setOf (integer (MIN:MAX)))
464  y-image-position-actual (1setOf (type2 keyword))
465  y-image-shift-actual (1setOf (integer (MIN:MAX)))
466  y-side1-image-shift-actual (1setOf (integer (MIN:MAX)))
467  y-side2-image-shift-actual (1setOf (integer (MIN:MAX)))
```

468 ## 8.2   Attribute Group tag Registrations

469 The following table lists all the attribute group tags defined in this document. These are to be registered according to
470 the procedures in [RFC2911] section 6.5.

```
471  Attribute Group tags:
472  job-actual
473  document-actual
```

474 # 79   Author's Address

475   Dennis Carney
476   IBM Printing Systems
477   6300 Diagonal Highway
478   Boulder, CO 80301
479   Phone: 303 924 0565
480   Fax: 303 924 7434
481   e-mail: dcarney@us.ibm.com
482
483   Harry Lewis
484   IBM Printing Systems
485   6300 Diagonal Highway
486   Boulder, CO 80301
487   Phone: 303 924 5337
488   Fax: 303 924 7434
489   e-mail: harryl@us.ibm.com
490
491 Additional contributors:
492   Tom Hastings, Xerox
493   Ira McDonald, High North
494   Gail Songer, Peerless
495   Peter Zehler, Xerox   <none so far>
496