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White Paper

The Printer Working Group

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2

IPP Presets (PRESET)

3

Status: Interim

4 Abstract: This document is a whitepaper that describes IPP Presets, a mechanism that
5 enables a set of Job Template attribute values to be applied as a set, to provide IPP print
6 solutions with a way to support a variety of user experience optimizations.

7 This document is a White Paper. For a definition of a "White Paper", see:
8 <http://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

9 This document is available electronically at:

10 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170807.odt>
11 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170807.pdf>

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13 Title: IPP Presets (*PRESET*)

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59 **1 Introduction**

60 This whitepaper defines a system of new IPP attributes that allow a Printer to describe a
61 set of one or more “presets”, which are a set of job template attributes and attribute values
62 that are applied together as a group. Each preset set has a named label and may also
63 have an associated “trigger”, allowing the preset to be applied implicitly in response to the
64 User making a particular settings selection.

65 **2 Terminology**

66 **2.1 Protocol Roles Terminology**

67 This document defines the following protocol roles in order to specify unambiguous
68 conformance requirements:

69 *Client*: Initiator of outgoing IPP session requests and sender of outgoing IPP operation
70 requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] User Agent).

71 *Printer*: Listener for incoming IPP session requests and receiver of incoming IPP operation
72 requests (Hypertext Transfer Protocol -- HTTP/1.1 [RFC7230] Server) that represents one
73 or more Physical Devices or a Logical Device.

74 **2.2 Printing Terminology**

75 All the printing terminology defined in IPP/1.1 Model and Semantics [RFC8011] are
76 applicable here:

77 *Client*: Initiator of outgoing IPP session requests and sender of outgoing IPP operation
78 requests (Hypertext Transfer Protocol (HTTP/1.1) user agent, as defined in [RFC7230]).

79 *Document*: An object created and managed by a Printer that contains description,
80 processing, and status information. A Document object can have attached data and is
81 bound to a single Job [PWG5100.5].

82 *'ipp' URI*: An IPP URI as defined in [RFC3510].

83 *'ipps' URI*: An IPP URI as defined in [RFC7472].

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

86 *Logical Device*: A print server, software service, or gateway that processes Jobs and
87 either forwards or stores the processed Job or uses one or more Physical Devices to
88 render output.

89 *Output Device*: A single Logical or Physical Device.

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

92 *Printer*: Listener for incoming IPP session requests and receiver of incoming IPP
93 operation requests (HTTP/1.1 server, as defined in [RFC7230]) that represents one or
94 more Physical Devices or a Logical Device.

95 **2.3 Other Terms Used in This Document**

96 *User*: A person or automata using a Client to communicate with a Printer.

97 **2.4 Acronyms and Organizations**

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

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

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

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

102 **3 Requirements for IPP Presets**

103 **3.1 Rationale for IPP Presets**

104 There are circumstances where a number of settings are chosen as a set to achieve some
105 common printing objective or workflow scenario. For example, the act of selecting a 4"x6"
106 media size implies the desire to print photos. If doing so could trigger the automatic
107 selection of an associated group of settings (change media type to glossy photo, setting
108 the print quality to 'best'), that could have a positive user experience benefit. Sometimes
109 these groups of settings are referred to as "presets".

110 Most vendor / model-specific drivers and driver system implement support for such
111 associations, but they do this by including logic in the driver itself. For driverless / omni-
112 driver systems such as IPP Everywhere, some settings collections could be constructed on
113 the Client system, but some could originate from the Printer. IPP needs to be extended to
114 provide attributes to convey these from the Printer to a Client to support Printer-originated
115 "presets", to support the use cases below.

116 There is currently no way for the Printer to supply explicit preset information to the Client.
117 Preset information can be configured by admin, operator, or vendor. A crude facility could
118 be provided using Validate-Job and the "preferred-attributes" in the response, but that
119 requires additional Client / Printer operations that are undesirable. This should be
120 manageable locally to the Client once the settings bundles have been provided to it by the
121 Printer.

122 After the application of a preset, the Client ought to still allow a User to change individual
123 settings. If a preset set "print-quality" to 'high' (5) and "print-color-mode" to 'color', the User
124 should still be capable of adjusting the control for "print-quality" to set its value to 'normal'
125 (4).

126 The PWG Semantic Model defined the concept of a "job ticket template". Saved job ticket
127 resources are similar but not exactly the same. In particular they lack the notion of a
128 "trigger".

129 **3.2 Use Cases**

130 **3.2.1 Explicit Preset Selection**

131 Bert has found a good recipe for gazpacho on the Web, and wants to print the recipe to put
132 it into his recipe binder. He clicks on the "Print" button in the web page. When the print
133 dialog is presented, he selects the settings preset labeled "Recipe for binder" in his print
134 dialog, that selects "2 pages per sheet" and disables two-sided printing all at once. Bert
135 decides he wants to re-enable two-sided printing, and does so. As the preset is simply a

136 batch application of settings, he is still free to make individual settings choices after a
137 preset is applied. He prints the recipe, cuts it to size, and puts it into his recipe binder.

138 **3.2.2 Implicit Preset Selection**

139 Kelli is in the process of printing a photo. In the print dialog, she switches the selected
140 media from A4 to 4"x6". The Printer has indicated that selecting the 4"x6" media size is a
141 trigger to select a preset including selecting a glossy photo media type, single-sided
142 printing, and 'high' print quality. The Client updates the print dialog and the job ticket
143 automatically to include those changes. Kelli is pleased that these choices were made
144 automatically by her system, saving her time and effort.

145 **3.2.3 Client Saving Preset Settings to Printer**

146 Ernie has constructed his own IPP preset on his system named "Better Binder Recipe",
147 and he would like to share it with Bert. Ernie selects that preset from a list of locally
148 created presets and clicks on the "Upload Preset to Printer" button. The preset is uploaded
149 to the Printer. When Bert next goes to print, he sees the "Better Binder Recipe" preset that
150 Ernie added to the Printer, and uses that for his next recipe printing tasks.

151 **3.3 Exceptions**

152 There are no exceptions.

153 **3.4 Out of Scope**

154 The following are considered out of scope for this document:

- 155 1. User presentation of these options
- 156 2. Changes to the core IPP specifications

157 **3.5 Design Requirements**

158 The design requirements for this document are:

- 159 1. Define new IPP attributes to specify a set of attributes and attribute values that
160 will be applied as a group when either a particular attribute value is chosen.
- 161 2. Support the specification of a "trigger" attribute value in the group, to support
162 implicit group selection.
- 163 3. Support the specification of a "label" or "label key" in the group, to support
164 explicit group selection via a name presented to the user, that might be
165 localized.
- 166 4. Register all attributes and operations with IANA

167 **4 Technical Solutions/Approaches**

168 This specification defines the following: an IPP attribute that creates an association
169 between a set of Job Template attribute names and values (a “preset”); define ancillary
170 member attributes to uniquely identify each preset set and allow a Client to support explicit
171 named selection of a set; and also define a mechanism that a Client can use to cause an
172 implicit selection of a preset set.

173 **4.1 job-presets-supported (1setOf collection)**

174 The “job-presets-supported” attribute provides a set of collections, where each collection
175 consists of a “preset-key (keyword | name(MAX))” attribute and the set of attribute names
176 and values, to be applied as a set by the Client when this preset is selected by the User.
177 The attribute names and values MUST be supported by the Printer and be listed in its
178 Printer Description attributes. The set of attribute values MUST NOT be in conflict with one
179 another as described by a constraint in “job-constraints-supported”.

180 A Printer MUST support the “job-presets-supported” attribute if it supports the “job-triggers-
181 supported” attribute.

182 **4.1.1 preset-key (keyword | name(MAX))**

183 The “preset-key” member attribute provides each collection in “job-presets-supported” with
184 a unique string identifier. Each “preset-key” MUST be unique within a “job-presets-
185 supported” attribute, so that each preset collection is uniquely identifiable and can be
186 unambiguously referenced using that “preset-key” value.

187 A localized string label for “preset-key” suitable for User presentation SHOULD be made
188 available by the Printer. A Client can acquire the localized string label by using the value of
189 “preset-key” as the lookup key in the strings catalog provided at the URL specified by
190 “printer-strings-uri” [PWG5100.13]. As a fallback, the “preset-key” value may be presented
191 directly; for this reason, the “preset-key” value SHOULD be descriptive.

192 **4.1.2 Examples**

193 Here is an example “job-presets-supported” attribute, which includes 2 collections,
194 described using PAPI:

```
195     job-presets-supported={  
196         preset-key="draft"  
197         print-quality=3  
198     }, {  
199         preset-key="photo"  
200         print-content-optimize='graphics'  
201         print-quality=5  
202     }
```


203 **4.2 “job-triggers-supported” (1setOf collection)**

204 The “job-triggers-supported” attribute provides a set of collections, where each collection
205 contains a “preset-key” member attribute (section 4.1.1), along with a single attribute name
206 and set of values. A Client, upon detecting that that attribute has acquired that particular
207 value, will apply the settings in the preset in “job-presets-supported” that has the matching
208 “preset-key” value.

209 A Printer MAY support the “job-triggers-supported” attribute if it supports the “job-presets-
210 supported” attribute.

211 **4.2.1 Examples**

212 Here is an example “job-triggers-supported” attribute, which includes 2 collections,
213 described using PAPI:

```
214     job-triggers-supported={  
215         preset-key="draft"  
216         media-col={media-type='stationery-recycled'}  
217     }, {  
218         preset-key="photo"  
219         media-col={media-type='photographic', 'photographic-  
220         glossy', 'photographic-matte'}  
221     }
```

222 In this example, if the user selects the 'stationery-recycled' media type, that will trigger the
223 selection of the “draft” preset from “job-presets-supported”.

224 **5 Internationalization Considerations**

225 For interoperability and basic support for multiple languages, conforming implementations
226 MUST support the Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8)
227 [RFC3629] encoding of Unicode [UNICODE] [ISO10646] and the Unicode Format for
228 Network Interchange [RFC5198].

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

- 231 • Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
- 232 • Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping
- 233 • Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
- 234 • Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences
- 235 • Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization

- 236 • Unicode Collation Algorithm [UTS10] – sorting
- 237 • Unicode Locale Data Markup Language [UTS35] – locale databases
- 238 Implementations of this specification are advised to also review the following informational
239 documents on processing of human-readable Unicode text strings:
- 240 • Unicode Character Encoding Model [UTR17] – multi-layer character model
- 241 • Unicode in XML and other Markup Languages [UTR20] – XML usage
- 242 • Unicode Character Property Model [UTR23] – character properties
- 243 • Unicode Conformance Model [UTR33] – Unicode conformance basis

244 **6 Security Considerations**

245 The IPP extensions defined in this document require the same security considerations as
246 defined in the IPP/1.1: Model and Semantics [RFC8011] plus additional security
247 considerations below .

248 **6.1 Human-readable Strings**

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

- 251 • Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks

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

- 254 • Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

255 **7 References**

256 **7.1 Normative References**

- 257 [ISO10646] "Information technology -- Universal Coded Character Set (UCS)",
258 ISO/IEC 10646:2011
- 259 [PWG5100.5] D. Carney, T. Hastings, P. Zehler. "Internet Printing Protocol (IPP):
260 Document Object", PWG 5100.5-2003, October 2003,
261 [http://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-
262 5100.5.pdf](http://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-5100.5.pdf)

- 263 [PWG5100.12] R. Bergman, H. Lewis, I. McDonald, M. Sweet, "IPP Version 2.0, 2.1,
264 and 2.2", PWG 5100.12-2015, October 2015,
265 <http://ftp.pwg.org/pub/pwg/standards/std-ipp20-20151030-5100.12.pdf>
- 266 [PWG5100.13] M. Sweet, I. McDonald, P. Zehler, "IPP: Job and Printer Extensions -
267 Set 3 (JPS3)", PWG 5100.13-2012, July 2012,
268 [http://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-
269 20120727-5100.13.pdf](http://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-20120727-5100.13.pdf)
- 270 [PWG5100.19] S. Kennedy, "IPP Implementor's Guide v2.0", PWG 5100.19-2015,
271 August 2015, [http://ftp.pwg.org/pub/pwg/candidates/cs-ippig20-
272 20150821-5100.19.pdf](http://ftp.pwg.org/pub/pwg/candidates/cs-ippig20-20150821-5100.19.pdf)
- 273 [RFC2817] R. Khare, S. Lawrence, "Upgrading to TLS Within HTTP/1.1", RFC
274 2817, May 2000, <https://www.ietf.org/rfc/rfc2817.txt>
- 275 [RFC3510] R. Herriot, I. McDonald, "Internet Printing Protocol/1.1: IPP URL
276 Scheme", RFC 3510, April 2003, <https://tools.ietf.org/html/rfc3510>
- 277 [RFC3629] F. Yergeau, "UTF-8, a transformation format of ISO 10646", RFC
278 3629, November 2003, <https://www.ietf.org/rfc/rfc3629.txt>
- 279 [RFC5198] J. Klensin, M. Padlipsky, "Unicode Format for Network Interchange",
280 RFC 5198, March 2008, <https://www.ietf.org/rfc/rfc5198.txt>
- 281 [RFC7230] R. Fielding, J. Reschke, "Hypertext Transfer Protocol (HTTP/1.1):
282 Message Syntax and Routing", RFC 7230, June 2014,
283 <http://www.ietf.org/rfc/rfc7230.txt>
- 284 [RFC7472] I. McDonald, M. Sweet, "Internet Printing Protocol (IPP) over HTTPS
285 Transport Binding and the 'ipps' URI Scheme", RFC 7472, March
286 2015, <https://tools.ietf.org/html/rfc7472>
- 287 [RFC8010] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1: Encoding and
288 Transport", RFC 8010, January 2017,
289 <https://www.ietf.org/rfc/rfc8010.txt>
- 290 [RFC8011] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1: Model and
291 Semantics", RFC 8011, January 2017,
292 <https://www.ietf.org/rfc/rfc8011.txt>
- 293 [UAX9] Unicode Consortium, "Unicode Bidirectional Algorithm", UAX#9, May
294 2016, <http://www.unicode.org/reports/tr9>
- 295 [UAX14] Unicode Consortium, "Unicode Line Breaking Algorithm", UAX#14,
296 June 2016, <http://www.unicode.org/reports/tr14>

- 297 [UAX15] Unicode Consortium, “Normalization Forms”, UAX#15, February 2016,
298 <http://www.unicode.org/reports/tr15>
- 299 [UAX29] Unicode Consortium, “Unicode Text Segmentation”, UAX#29, June
300 2016, <http://www.unicode.org/reports/tr29>
- 301 [UAX31] Unicode Consortium, “Unicode Identifier and Pattern Syntax”,
302 UAX#31, May 2016, <http://www.unicode.org/reports/tr31>
- 303 [UNICODE] The Unicode Consortium, “Unicode® 10.0.0”, June 2017,
304 <http://unicode.org/versions/Unicode10.0.0/>
- 305 [UTS10] Unicode Consortium, “Unicode Collation Algorithm”, UTS#10, May
306 2016, <http://www.unicode.org/reports/tr10>
- 307 [UTS35] Unicode Consortium, “Unicode Locale Data Markup Language”,
308 UTS#35, October 2016, <http://www.unicode.org/reports/tr35>
- 309 [UTS39] Unicode Consortium, “Unicode Security Mechanisms”, UTS#39, June
310 2016, <http://www.unicode.org/reports/tr39>

311 7.2 Informative References

- 312 [UNISECFAQ] Unicode Consortium “Unicode Security FAQ”, November 2016,
313 <http://www.unicode.org/faq/security.html>
- 314 [UTR17] Unicode Consortium “Unicode Character Encoding Model”, UTR#17,
315 November 2008, <http://www.unicode.org/reports/tr17>
- 316 [UTR20] Unicode Consortium “Unicode in XML and other Markup Languages”,
317 UTR#20, January 2013, <http://www.unicode.org/reports/tr20>
- 318 [UTR23] Unicode Consortium “Unicode Character Property Model”, UTR#23,
319 May 2015, <http://www.unicode.org/reports/tr23>
- 320 [UTR33] Unicode Consortium “Unicode Conformance Model”, UTR#33,
321 November 2008, <http://www.unicode.org/reports/tr33>

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330 Ira McDonald – High North

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332 **9 Change History**

333 **9.1 August 7, 2017**

334 Minor clarifications and editorial changes to section 3.

335 **9.2 July 28, 2017**

336 Updated following IPP WG review and feedback:

- 337 • Added Printing Terminology by copy / paste from RFC 8011 section 2.2
- 338 • Incorporated Internationalization and Security Considerations content from IPP
339 System
- 340 • Added and fixed many references
- 341 • Refactored section 4 according to the meeting minutes to include PAPI examples to
342 better illustrate the structure, which is difficult to articulate using conventional IPP
343 syntax (since there isn't a formal "data type" for "any attribute")

344 Other additions and changes:

- 345 • Added a new use case "Client Saving Preset Settings to Printer" to explore how that
346 might be supported in IPP, and if that requires additional definitions.

347 **9.3 June 9, 2017**

348 Updated and refactored following May 11 IPP WG teleconference

- 349 • Expanded use case descriptions
- 350 • Refactored IPP attribute definitions

351 **9.4 April 18, 2017**

352 Initial revision.