



July 28, 2017
White Paper

The Printer Working Group

1
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-20170728.odt>
11 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170728.pdf>

12 Copyright © 2017 The Printer Working Group. All rights reserved.

13 Title: IPP Presets (*PRESET*)

14 The material contained herein is not a license, either expressed or implied, to any IPR
15 owned or controlled by any of the authors or developers of this material or the Printer
16 Working Group. The material contained herein is provided on an “AS IS” basis and to the
17 maximum extent permitted by applicable law, this material is provided AS IS AND WITH
18 ALL FAULTS, and the authors and developers of this material and the Printer Working
19 Group and its members hereby disclaim all warranties and conditions, either expressed,
20 implied or statutory, including, but not limited to, any (if any) implied warranties that the use
21 of the information herein will not infringe any rights or any implied warranties of
22 merchantability or fitness for a particular purpose.

23 **Table of Contents**

24 [1 Introduction.....4](#)

25 [2 Terminology.....4](#)

26 [2.1 Protocol Roles Terminology.....4](#)

27 [2.2 Printing Terminology.....4](#)

28 [2.3 Other Terms Used in This Document.....5](#)

29 [2.4 Acronyms and Organizations.....5](#)

30 [3 Requirements for IPP Presets.....6](#)

31 [3.1 Rationale for IPP Presets.....6](#)

32 [3.2 Use Cases.....6](#)

33 [3.2.1 Explicit Preset Selection.....6](#)

34 [3.2.2 Implicit Preset Selection.....7](#)

35 [3.2.3 Client Saving Preset Settings to Printer.....7](#)

36 [3.3 Exceptions.....7](#)

37 [3.4 Out of Scope.....7](#)

38 [3.5 Design Requirements.....7](#)

39 [4 Technical Solutions/Approaches.....7](#)

40 [4.1 job-presets-supported \(1setOf collection\).....8](#)

41 [4.1.1 preset-key \(keyword | name\(MAX\)\).....8](#)

42 [4.1.2 Examples.....8](#)

43 [4.2 “job-triggers-supported” \(1setOf collection\).....9](#)

44 [4.2.1 Examples.....9](#)

45 [5 Internationalization Considerations.....9](#)

46 [6 Security Considerations.....10](#)

47 [6.1 Human-readable Strings.....10](#)

48 [7 References.....10](#)

49 [7.1 Normative References.....10](#)

50 [7.2 Informative References.....12](#)

51 [8 Authors' Addresses.....12](#)

52 [9 Change History.....14](#)

53 [9.1 July 28, 2017.....14](#)

54 [9.2 June 9, 2017.....14](#)

55 [9.3 April 18, 2017.....14](#)

56 **List of Figures**

57 **List of Tables**

58 **1 Introduction**

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

64 **2 Terminology**

65 **2.1 Protocol Roles Terminology**

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

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

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

73 **2.2 Printing Terminology**

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

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

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

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

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

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

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

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

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

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

94 **2.3 Other Terms Used in This Document**

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

96 **2.4 Acronyms and Organizations**

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

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

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

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

101 **3 Requirements for IPP Presets**

102 **3.1 Rationale for IPP Presets**

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

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

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

121 It is desirable that individual settings changed by the application of a preset are still able to
122 be configurable by the User.

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

126 **3.2 Use Cases**

127 **3.2.1 Explicit Preset Selection**

128 Bert has found a good recipe for gazpacho on the Web, and wants to print the recipe to put
129 it into his recipe binder. He clicks on the "Print" button in the web page. When the print
130 dialog is presented, he selects the settings preset labeled "Recipe for binder" in his print
131 dialog, that selects "2 pages per sheet" and disables two-sided printing all at once. Bert
132 decides he wants to re-enable two-sided printing, and does so. As the preset is simply a
133 batch application of settings, he is still free to make individual settings choices after a
134 preset is applied. He prints the recipe, cuts it to size, and puts it into his recipe binder.

135 **3.2.2 Implicit Preset Selection**

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

142 **3.2.3 Client Saving Preset Settings to Printer**

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

148 **3.3 Exceptions**

149 There are no exceptions.

150 **3.4 Out of Scope**

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

- 152 1. User presentation of these options
- 153 2. Changes to the core IPP specifications

154 **3.5 Design Requirements**

155 The design requirements for this document are:

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

164 **4 Technical Solutions/Approaches**

165 This specification defines the following: an IPP attribute that creates an association
166 between a set of Job Template attribute names and values (a "preset"); define ancillary

167 member attributes to uniquely identify each preset set and allow a Client to support explicit
168 named selection of a set; and also define a mechanism that a Client can use to cause an
169 implicit selection of a preset set.

170 **4.1 job-presets-supported (1setOf collection)**

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

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

179 **4.1.1 preset-key (keyword | name(MAX))**

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

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

189 **4.1.2 Examples**

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

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


200 **4.2 “job-triggers-supported” (1setOf collection)**

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

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

208 **4.2.1 Examples**

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

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

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

221 **5 Internationalization Considerations**

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

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

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

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

241 **6 Security Considerations**

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

245 **6.1 Human-readable Strings**

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

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

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

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

252 **7 References**

253 **7.1 Normative References**

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

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

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

308 7.2 Informative References

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

319 8 Authors' Addresses

320 Primary authors (using Address style):

321 Smith Kennedy
322 11311 Chinden Blvd.
323 Boise, Idaho 83714
324 smith.kennedy@hp.com

325 The authors would also like to thank the following individuals for their contributions to this
326 standard:

327 Ira McDonald – High North

328 Mike Sweet – Apple Inc.

329 **9 Change History**

330 **9.1 July 28, 2017**

331 Updated following IPP WG review and feedback:

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

339 Other additions and changes:

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

342 **9.2 June 9, 2017**

343 Updated and refactored following May 11 IPP WG teleconference

- 344 • Expanded use case descriptions
- 345 • Refactored IPP attribute definitions

346 **9.3 April 18, 2017**

347 Initial revision.