



August 22, 2017
IPP Registration

The Printer Working Group

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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-20170822.odt>
11 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170822.pdf>

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13 Title: IPP Presets (*PRESET*)

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69 **1 Introduction**

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

75 **2 Terminology**

76 **2.1 Protocol Roles Terminology**

77 This document defines the following protocol roles in order to specify unambiguous
78 conformance requirements:

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

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

84 **2.2 Printing Terminology**

85 All the printing terminology defined in IPP/1.1 Model and Semantics [RFC8011] is
86 applicable here:

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

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

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

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

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

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

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

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

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

105 **2.3 Other Terms Used in This Document**

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

107 *Preset* : A set of attributes and attribute values that are applied all at once as job settings.

108 *Trigger* : An attribute and value whose selection causes a Preset to be selected.

109 **2.4 Acronyms and Organizations**

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

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

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

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

114 **3 Requirements for IPP Presets**

115 **3.1 Rationale for IPP Presets**

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

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

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

134 After the application of a preset, the Client should allow a User to change individual
135 settings. For example, if a preset includes "print-quality" of 'high' (5) and "print-color-mode"
136 of 'color', the Client should allow the User to change the "print-quality" to 'normal' (4).

137 The PWG Semantic Model [PWG5105.1] defined the concept of a "job ticket template".
138 Saved job ticket resources are similar but not exactly the same. In particular they lack the
139 notion of a "trigger".

140 **3.2 Use Cases**

141 **3.2.1 Explicit Preset Selection**

142 Bert has found a good recipe for gazpacho on the Web, and wants to print the recipe to put
143 it into his recipe binder. He clicks on the "Print" button in the web page. When the print
144 dialog is presented, he selects the Preset labeled "Recipe for binder". The "Recipe for
145 binder" Preset specifies "2 pages per sheet" page layout, one-sided printing, trimming and
146 punching. The Client applies the Preset to the settings in the print dialog. Bert clicks on
147 "Print"; the Client prints the Job. Bert puts it into his recipe binder.

148 **3.2.2 Implicit Preset Selection**

149 Kelli is in the process of printing a photo. In the print dialog, she switches the selected
150 media size from A4 to 4"x6". Her Client has a Trigger for 4"x6" media size that names a
151 Preset named "Photos"; the "Photos" Preset includes glossy photo media type, single-
152 sided printing, and 'high' print quality. The Client acts on the Trigger by applying the
153 settings in the "Photos" Preset. Kelli is pleased that these choices were made
154 automatically by her system, saving her time and effort.

155 **3.2.3 Client Storing a Preset to Printer**

156 Ernie has constructed his own Preset named "Better Binder Recipe", and he would like to
157 share it with Bert. Ernie selects that Preset and taps on the "Store Preset on Printer"
158 button. The preset is uploaded to the Printer. When Bert next goes to print, he sees the
159 "Better Binder Recipe" preset that Ernie added to the Printer, and uses that for his next
160 recipe printing tasks.

161 **3.3 Exceptions**

162 **3.3.1 Overriding Preset Selection**

163 Bert selects the Preset labeled "Recipe for binder" in his print dialog, that selects "2 pages
164 per sheet" page layout, one-sided printing, trimming and punching. Bert decides he wants
165 to re-enable two-sided printing, and does so using the controls in the print dialog. He prints
166 the recipe and puts it into his recipe binder, pleased that he can take advantage of the
167 power of Presets but still maintain full control over a Job's settings.

168 **3.4 Out of Scope**

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

- 170 1. The user interface for Presets
- 171 2. Changes to the core IPP specifications

172 **3.5 Design Requirements**

173 The design requirements for this document are:

- 174 1. Define new IPP attributes that describe a Preset as a set of attributes and
175 attribute values that will be applied all at once. Each Preset is to have a unique
176 name.
- 177 2. Define new IPP attributes that describe a Trigger as an attribute and value and a
178 corresponding Preset name, that operates according to the principle "if Trigger
179 attribute value is chosen, then apply Preset", to support implicit Preset selection.
- 180 3. Define sections to register all attributes, values, operations, and service types
181 with IANA.

182 **4 IPP Presets Definitions**

183 This specification defines IPP attributes and operations used for Presets and Triggers.

184 **4.1 Printer Description Attributes**

185 **4.1.1 job-presets-supported (1setOf collection)**

186 This REQUIRED Printer Description attribute lists named Presets that are stored on the
187 Printer. Each collection value contains a REQUIRED “preset-name (keyword |
188 name(MAX))” attribute and one or more Job Template attributes that are part of the Preset.
189 The attribute names and values MUST be supported by the Printer and be listed in its
190 Printer Description attributes. The set of attribute values MUST NOT be in conflict with one
191 another as described by a constraint in “job-constraints-supported”.

192 **4.1.1.1 preset-name (keyword | name(MAX))**

193 This attribute provides a unique name for the Preset. Values can be localized using the
194 message catalog provided at the URL specified by the “printer-strings-uri” Printer
195 Description attribute [PWG5100.13].

196 **4.1.1.2 Examples**

197 Below is an example “job-presets-supported” attribute, which includes 2 collections,
198 described using PAPI notation [PAPI]:

```
199     job-presets-supported={  
200         preset-name="draft"  
201         print-quality=3  
202     }, {  
203         preset-name="photo"  
204         print-content-optimize='graphics'  
205         print-quality=5  
206     }
```

207 **4.1.2 job-triggers-supported (1setOf collection)**

208 This RECOMMENDED Printer Description attribute lists Triggers that are stored on the
209 Printer. Each collection value contains a REQUIRED “preset-name (keyword |
210 name(MAX))” member attribute (section 4.1.1.1) and one or more Job Template attributes
211 that are part of the Trigger.

212 **4.1.2.1 Examples**


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

```
215     job-triggers-supported={
216         preset-name="draft"
217         media-col={media-type='stationery-recycled'}
218     }, {
219         preset-name="photo"
220         media-col={media-type='photographic', 'photographic-
221         glossy', 'photographic-matte'}
222     }
```

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

225 4.2 Storing Presets and Triggers

226 Presets and Triggers may be constructed by a User and stored locally on the Client. In
227 some cases (as described in the use case in section 3.2.3), the Client may want to store
228 those Presets and Triggers on the Printer. A Client can store a Preset or a Trigger on the
229 Printer using the Set-Printer-Attributes operation [RFC3380].

230 If a Printer supports accepting new Presets and Triggers via a Set-Printer-Attributes
231 operation, it advertises this by listing “Set-Printer-Attributes” in its “operations-supported”
232 Printer Description attribute [RFC8011], and by also listing “job-presets-supported” and
233 “job-triggers-supported” in its “printer-settable-attributes-supported” Printer Description
234 attribute [RFC3380]. 

235 4.3 Using Resources

- 236 • Talk about resource-ids member attributes in job-presets-supported collection to
237 include Job Template and other resources in the Job Ticket.
- 238 • Reference to IPP System Service spec

239 5 Client Implementation Recommendations

240 5.1 Presets

241 A Client should list available Presets by name in some manner in its UI presenting printing
242 choices. The Presets may come from the Printer or they may be created by the Client and
243 persisted in some way. When a User selects a Preset, the print settings in that Preset
244 should be applied. Implementors of Clients may want to consider what to do when a
245 setting has been changed by the user and then a Preset has been selected that might
246 change that setting. The Client might notify the User that the setting will be changed, or
247 alternately might apply the Preset but not change the setting changed by the User.

248 **5.2 Triggers**

249 The semantic expectation of a Trigger is “IF setting value is chosen, THEN apply Preset”.
250 Upon detecting that a Trigger's setting value has been chosen by the User, the Client
251 applies the Preset. Client implementors may want to consider cases where Triggers are
252 disabled, such as following manual selection by a user, or perhaps only allowing one
253 Trigger per “print dialog session” to be used.

254 A Trigger should only be applied in response to user input, and not in response to a value
255 being set by another Preset, a constraint, or some other automatic selection implemented
256 by the Client.

257 **6 Conformance Requirements**

258 **6.1 Conformance Requirements for Clients**

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

- 260 1. The IPP Printer attributes defined in section 4.1;
- 261 2. The internationalization considerations in section 7;
- 262 3. The security considerations in section 8.

263 **6.2 Conformance Requirements for Printers**

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

- 265 1. The IPP Printer attributes defined in section 4.1;
- 266 2. The internationalization considerations in section 7;
- 267 3. The security considerations in section 8.

268 **7 Internationalization Considerations**

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

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

- 275 • Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
- 276 • Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping

- 277 • Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
- 278 • Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences
- 279 • Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- 280 • Unicode Collation Algorithm [UTS10] – sorting
- 281 • Unicode Locale Data Markup Language [UTS35] – locale databases

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

- 284 • Unicode Character Encoding Model [UTR17] – multi-layer character model
- 285 • Unicode in XML and other Markup Languages [UTR20] – XML usage
- 286 • Unicode Character Property Model [UTR23] – character properties
- 287 • Unicode Conformance Model [UTR33] – Unicode conformance basis

288 **8 Security Considerations**

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

292 **8.1 Human-readable Strings**

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

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

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

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

299 **9 IANA and PWG Considerations**

300 **9.1 Attribute Registrations**

301 The attributes defined in this document will be published by IANA according to the
302 procedures in IPP Model and Semantics [RFC8011] section 6.2 in the following file:

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

304 The registry entries will contain the following information:

305	Printer Description attributes:	Reference
306	-----	-----
307	job-presets-supported (1setOf collection)	[5100.PRESET]
308	preset-name (keyword name(MAX))	[5100.PRESET]
309	job-triggers-supported (1setOf collection)	[5100.PRESET]
310	preset-name (keyword name(MAX))	[5100.PRESET]

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394 standard:

395 Ira McDonald – High North
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397 **12 Change History**

398 **12.1 August 22, 2017**

399 Updated as per feedback from August 2017 PWG vF2F session:

- 400 • Extensively updated structure of section 4 “IPP Presets Definitions”
 - 401 ◦ Added section 4.2 to discuss storing presets using Set-Printer-Attributes
 - 402 ◦ Added section 4.3 (placeholder) to discuss storing presets as resources
- 403 • Added “Client Implementation Recommendations” section
- 404 • Added “Conformance Requirements” section
- 405 • Added “IANA and PWG Considerations” section

406 **12.2 August 7, 2017**

407 Minor clarifications and editorial changes to section 3.

408 **12.3 July 28, 2017**

409 Updated following IPP WG review and feedback:

- 410 • Added Printing Terminology by copy / paste from RFC 8011 section 2.2
- 411 • Incorporated Internationalization and Security Considerations content from IPP
412 System
- 413 • Added and fixed many references
- 414 • Refactored section 4 according to the meeting minutes to include PAPI examples to
415 better illustrate the structure, which is difficult to articulate using conventional IPP
416 syntax (since there isn't a formal “data type” for “any attribute”

417 Other additions and changes:

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

420 **12.4 June 9, 2017**

421 Updated and refactored following May 11 IPP WG teleconference

422 • Expanded use case descriptions

423 • Refactored IPP attribute definitions

424 **12.5 April 18, 2017**

425 Initial revision.