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White Paper

The Printer Working Group

IPP Presets
(PRESET)

Status: Interim

Abstract: This document is a whitepaper that describes IPP Presets, a mechanism that enables a set of Jjob Ttemplate attribute values to be appliedset as a set, to provide IPP print solutions with a way to support a variety of user experience optimizations.

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

This document is available electronically at:

https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170807.odt
~~https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170609.odt~~
https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170807.pdf
~~https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170609.pdf~~

Title: IPP Presets *(PRESET)*

The Printer Working Group

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1 Introduction

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

2 Terminology

2.1 Protocol Roles Terminology

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

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

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

2.2 Printing Terminology

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

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

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

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

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

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

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

Output Device: A single Logical or Physical Device.

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

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

2.3 Other Terms Used in This Document

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

2.4 Acronyms and Organizations

IANA: Internet Assigned Numbers Authority, http://www.iana.org/

IETF: Internet Engineering Task Force, http://www.ietf.org/

ISO: International Organization for Standardization, http://www.iso.org/

PWG: Printer Working Group, http://www.pwg.org/

3 Requirements for IPP Presets

3.1 Rationale for IPP Presets

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

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

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

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

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

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

3.2 Use Cases

~~Provide use cases for the document in subsections using the casual use case format.~~

Explicit Preset Selection

Bert has found a good recipe for gazpacho on the Web, and wants to print the recipe to put it into his recipe binder. He clicks on the “Print” button in the web page. When the print

dialog is presented, he selects the settings preset labeled “Recipe for binder” in his print dialog, that selects “2 pages per sheet” and disables two-sided printing all at once. Bert decides he wants to re-enable two-sided printing, and does so. As the preset is simply a batch application of settings, he is still free to make individual settings choices after a preset is applied. He prints the recipe, cuts it to size, and puts it into his recipe binder.

3.2.1 Implicit Preset Selection

Kelli is in the process of printing a photo. In the print dialog, she switches the selected media from A4 to 4”x6”. The Printer has indicated that selecting t~~t~~he 4”x6” media size is a trigger to select a preset including selecting~~ssociated with~~ a glossy photo media type, single-sided printing, and 'high~~best~~' print quality. The Client updates the print dialog and the job ticket automatically to include those changes. Kelli is pleased that these choices were made automatically by her system, saving her time and effort.

3.2.2 Client Saving Preset Settings to Printer

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

3.3 Exceptions

There are no exceptions.

3.4 Out of Scope

The following are considered out of scope for this document:

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

3.5 Design Requirements

The design requirements for this document are:

1. Define new IPP attributes to specify a set~~groups~~ of attributes and attribute values that will be applied as a group when either a particular attribute value is chosen.
2. Support the specification of a “trigger” attribute value in the group, to support implicit group selection.
3. Support the specification of a “label” or “label key” in the group, to support explicit group selection via a name presented to the user, that might be localized.

4. Register all attributes and operations with IANA

4 Technical Solutions/Approaches

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

4.1 “job-presets-supported” (1setOf collection)

The “job-presets-supported” attribute provides a set of collections, where each collection consists of a “preset-key (keyword | name(MAX))” attribute and the seta group of attribute names and values, be applied as a setll at once by the Client when this . Each “preset is selected by the User. The attribute names and values -key” MUST be supported by the Printer and be listed in its Printer Description unique within a “job-presets-supported” attributes. The set of attribute values MUST NOT , so that a particular preset can be in conflict with one another as describunambiguously referenced by a constraint in “job-constraints-supported”.that “preset-key”. A localized string label for “preset-key” suitable for User presentation SHOULD be made available by the Printer. A Client can acquire the label by using the value of “preset-key” as the lookup key in the strings catalog provided at the URL specified by “printer-strings-uri” [PWG5100.13].

The attribute names and values MUST be supported by the Printer and be listed in its Printer Description attributes. The set of attribute values MUST NOT be in conflict with one another as described by a constraint in “job-constraints-supported”.

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

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

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

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

4.1.2 Examples

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

```
job-presets-supported={
    preset-key="draft"
    print-quality=3
},{
    preset-key="photo"
    print-content-optimize='graphics'
    print-quality=5
}
```

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

The “job-triggers-supported” attribute provides a set of collections, where each collection contains a “preset-key ~~(keyword | name(MAX))~~” member attribute (section 4.1.1), along with a singl~~en~~ attribute name and set of value~~s.~~ [comment] Client, upon detecting that that attribute has acquired that particular value, will apply~~may respond by selecting~~ the settings in the preset in “job-presets-supported” that has the matching “preset-key” value.

A Printer MAY support the “job-triggers-supported” attribute if it supports the “job-presets-supported” attribute. [comment]

4.2.1 Examples

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

```
job-triggers-supported={
    preset-key="draft"
    media-col={media-type='stationery-recycled'}
},{
    preset-key="photo"
    media-col={media-type='photographic','photographic-
glossy','photographic-matte'}
}
```

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

5 Internationalization Considerations

For interoperability and basic support for multiple languages, conforming i~~i~~mplementations MUST support~~use~~ the Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-

8) [RFC3629]~~[RFC3629]~~ encoding of Unicode [UNICODE] [ISO10646] and the Unicode Format for Network Interchange [RFC5198].

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

- Unicode Bidirectional Algorithm [UAX9] – left-to-right, right-to-left, and vertical
- Unicode Line Breaking Algorithm [UAX14] – character classes and wrapping
- Unicode Normalization Forms [UAX15] – especially NFC for [RFC5198]
- Unicode Text Segmentation [UAX29] – grapheme clusters, words, sentences
- Unicode Identifier and Pattern Syntax [UAX31] – identifier use and normalization
- Unicode Collation Algorithm [UTS10] – sorting
- Unicode Locale Data Markup Language [UTS35] – locale databases

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

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

6 Security Considerations

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

~~There are no security considerations specific to this system other than those already defined in IPP/1.1 [RFC8011] and IPP/2.0[PWG5100.12].~~

Human-readable Strings

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

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

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

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

7 References

7.1 Normative References

[ISO10646] "Information technology -- Universal Coded Character Set (UCS)", ISO/IEC 10646:2011

[PWG5100.5] D. Carney, T. Hastings, P. Zehler. “Internet Printing Protocol (IPP): Document Object”, PWG 5100.5-2003, October 2003, http://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject10-20031031-5100.5.pdf

~~[PWG5100.12] R. Bergman, H. Lewis, I. McDonald, M. Sweet, "IPP/2.0 Second Edition", PWG 5100.12-2011, February 2011, http://ftp.pwg.org/pub/pwg/candidates/cs-ipp20-20110214-5100.12.pdf~~

[PWG5100.12] R. Bergman, H. Lewis, I. McDonald, M. Sweet, "IPP Version 2.0, 2.1, and 2.2", PWG 5100.12-2015, October 2015, http://ftp.pwg.org/pub/pwg/standards/std-ipp20-20151030-5100.12.pdf

[PWG5100.13] M. Sweet, I. McDonald, P. Zehler, "IPP: Job and Printer Extensions - Set 3 (JPS3)", PWG 5100.13-2012, July 2012, http://ftp.pwg.org/pub/pwg/candidates/cs-ippjobprinterext3v10-20120727-5100.13.pdf

[PWG5100.19] S. Kennedy, "IPP Implementor's Guide v2.0", PWG 5100.19-2015, August 2015, http://ftp.pwg.org/pub/pwg/candidates/cs-ippig20-20150821-5100.19.pdf

[RFC2817] R. Khare, S. Lawrence, “Upgrading to TLS Within HTTP/1.1”, RFC 2817, May 2000, https://www.ietf.org/rfc/rfc2817.txt

[RFC3510] R. Herriot, I. McDonald, “Internet Printing Protocol/1.1: IPP URL Scheme”, RFC 3510, April 2003, https://tools.ietf.org/html/rfc3510

[RFC3629] F. Yergeau, “UTF-8, a transformation format of ISO 10646”, RFC 3629, November 2003, https://www.ietf.org/rfc/rfc3629.txt

[RFC5198] J. Klensin, M. Padlipsky, “Unicode Format for Network Interchange”, RFC 5198, March 2008, https://www.ietf.org/rfc/rfc5198.txt

[RFC7230] R. Fielding, J. Reschke, "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing", RFC 7230, June 2014, http://www.ietf.org/rfc/rfc7230.txt

[RFC7472] I. McDonald, M. Sweet, “Internet Printing Protocol (IPP) over HTTPS Transport Binding and the 'ipps' URI Scheme”, RFC 7472, March 2015, https://tools.ietf.org/html/rfc7472

[RFC8010] M. Sweet, I. McDonald, “Internet Printing Protocol/1.1: Encoding and Transport”, RFC 8010, January 2017, https://www.ietf.org/rfc/rfc8010.txt

~~[RFC8010] M. Sweet, I. McDonald, “Internet Printing Protocol/1.1: Encoding and Transport”, RFC 8010, January 2017, https://www.ietf.org/rfc/rfc8010.txt~~

[RFC8011] M. Sweet, I. McDonald, “Internet Printing Protocol/1.1: Model and Semantics”, RFC 8011, January 2017, https://www.ietf.org/rfc/rfc8011.txt

[UAX9] Unicode Consortium, “Unicode Bidirectional Algorithm”, UAX#9, May 2016, http://www.unicode.org/reports/tr9

~~[UNICODE] The Unicode Consortium, “The Unicode Standard, Version 6.2.0”, ISBN 978-1-936213-07-8, September 2012, http://www.unicode.org/versions/Unicode6.2.0/~~

[UAX14] Unicode Consortium, “Unicode Line Breaking Algorithm”, UAX#14, June 2016, http://www.unicode.org/reports/tr14

[UAX15] Unicode Consortium, “Normalization Forms”, UAX#15, February 2016, http://www.unicode.org/reports/tr15

[UAX29] Unicode Consortium, “Unicode Text Segmentation”, UAX#29, June 2016, http://www.unicode.org/reports/tr29

[UAX31] Unicode Consortium, “Unicode Identifier and Pattern Syntax”, UAX#31, May 2016, http://www.unicode.org/reports/tr31

[UNICODE] The Unicode Consortium, “Unicode® 10.0.0”, June 2017, http://unicode.org/versions/Unicode10.0.0/

[UTS10] Unicode Consortium, “Unicode Collation Algorithm”, UTS#10, May 2016, http://www.unicode.org/reports/tr10

[UTS35] Unicode Consortium, “Unicode Locale Data Markup Language”, UTS#35, October 2016, http://www.unicode.org/reports/tr35

[UTS39] Unicode Consortium, “Unicode Security Mechanisms”, UTS#39, June 2016, http://www.unicode.org/reports/tr39

7.2 Informative References

[UNISECFAQ] Unicode Consortium “Unicode Security FAQ”, November2016, http://www.unicode.org/faq/security.html

[UTR17] Unicode Consortium “Unicode Character Encoding Model”, UTR#17, November 2008, http://www.unicode.org/reports/tr17

[UTR20] Unicode Consortium “Unicode in XML and other Markup Languages”, UTR#20, January 2013, http://www.unicode.org/reports/tr20

[UTR23] Unicode Consortium “Unicode Character Property Model”, UTR#23, May 2015, http://www.unicode.org/reports/tr23

[UTR33] Unicode Consortium “Unicode Conformance Model”, UTR#33, November 2008, http://www.unicode.org/reports/tr33

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9 Change History

9.1 August 7, 2017

Minor clarifications and editorial changes to section 3.

9.2 July 28, 2017

Updated following IPP WG review and feedback:

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

Other additions and changes:

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

9.3 June 9, 2017

Updated and refactored following May 11 IPP WG teleconference

- Expanded use case descriptions
- Refactored IPP attribute definitions

9.4 April 18, 2017

Initial revision.

