The Printer Working Group

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Working Draft

IPP Message Catalog Tooltips and Help Extensions
(TOOLTIP**)**

Status: Initial

Abstract: Localized content packaged with software frequently includes documentation content ("help") to provide the user with assistance on using that software. IPP Printers provide their own localized content IPP Message Catalog files hosted in the device. This Best Practices document specifies a convention extending the Message Catalog content syntax and semantics to specify "help" content, to enable IPP based universal print driver systems achieve closer feature parity with traditional driver systems.

This is a PWG Best Practice document. For the definition of "PWG Best Practices", see:

http://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf

This document is available electronically at:

http://ftp.pwg.org/pub/pwg/ipp/white/wd-ipptooltip-20190419.docx
http://ftp.pwg.org/pub/pwg/ipp/white/wd-ipptooltip-20190419.pdf

Title: IPP Message Catalog Tooltips and Help Extensions (TOOLTIP)

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1. Introduction

Localized content packaged with software frequently includes documentation content ("help") to provide the user with assistance on using that software. This has taken several forms, including "Help" documentation provided in an electronic manual format, and as "contextual help" ("tooltips") that is usually provided inline. IPP Printers provide their own localized content IPP Message Catalog files hosted in the device. This Best Practices document specifies a convention extending the Message Catalog content syntax and semantics to specify "help" content, to enable IPP based universal print driver systems achieve closer feature parity with traditional driver systems.

2. Terminology

2.1 Conformance Terminology

Capitalized terms, such as MUST, MUST NOT, RECOMMENDED, REQUIRED, SHOULD, SHOULD NOT, MAY, and OPTIONAL, have special meaning relating to conformance as defined in Key words for use in RFCs to Indicate Requirement Levels [RFC2119]. The term CONDITIONALLY REQUIRED is additionally defined for a conformance requirement that applies when a specified condition is true.

2.2 Printing Terminology

Normative definitions and semantics of printing terms are imported from IETF Printer MIB v2 [RFC3805], IETF Finisher MIB [RFC3806], and IETF Internet Printing Protocol/1.1: Model and Semantics [STD92].

Administrator: An End User who is also authorized to manage all aspects of an Output Device or Printer, including creating the printer instances and controlling the authorization of other End Users and Operators [RFC2567].

Document: An object created and managed by an Imaging Service that contains the description, processing, and status information. A Document object may have attached data and is bound to a single Job object [RFC8011].

End User: A person or software process that is authorized to perform basic printing functions, including finding/locating a printer, creating a local instance of a printer, viewing printer status, viewing printer capabilities, submitting a print job, viewing print job status, and altering the attributes of a print job [RFC2567].

Job: An object created and managed by an Imaging Service that contains the description, processing, and status information. A Job object also contains zero or more Document objects [RFC8011].

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 [RFC8011].

Operator: An End User that also has special rights on the Output Device or Printer. The Operator typically monitors the status of the Printer and manages and controls the Jobs at the Output Device [RFC2567]. The Operator is allowed to query and control the Printer, Jobs, and Documents based on site policy.

Output Device: a single Logical or Physical Device [PWG5100.18].

Owner: The End User or Administrator who owns and manages (and typically created) a Job, Printer, Resource, Subscription, or System [PWG5108.06].

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

2.3 Protocol Role Terminology

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

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

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

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. Rationale for IPP Message Catalog Tooltips and Help Extensions

Existing specifications define the following:

1. IPP: Job and Printer Extensions – Set 3 (JPS3) [PWG5100.13] defines the Message Catalog content type ("text/strings") that defines mappings between attribute name and/or value keys and localized string value equivalents, made available at a URL specified by the "printer-strings-uri" Printer Description attribute.

End users and print system deployment administrators are increasingly demanding that clients and printers support capabilities via universal print system ecosystems such as IPP Everywhere™ [PWG5100.14] with feature parity approaching that of traditional model-specific vendor-provided driver systems. To enable IPP to support these demands, this specification should:

1. Extend the Message Catalog syntax to support "tool tips" and "online help" for any attribute or attribute value provided;

3.1 Use Cases

The following use cases articulate the value that the extensions proposed later can provide to the IPP ecosphere.

3.1.1 User Seeking Assistance on Printer Feature Use

Garth has edited a photo and wants to print it to an IPP Everywhere™ printer. When looking through the printer's features in the print dialog window, he discovers a feature that he doesn't quite understand how to use. He clicks on the "?" button in the dialog to cause the presentation of the "Help" window. The application fetches the help content from the printer and presents that content for the controls currently visible in the Help window. Garth reads the presented content and gains an understanding of the feature.

3.1.2 User Seeking Explanation of Feature Name in Print Dialog

Violet is editing a paper and wants to print it to an IPP Everywhere™ printer. When looking through the printer's features in the print dialog window, she discovers a feature selection whose name doesn't obviously describe its meaning. She drags her mouse pointer over the name to cause the presentation of a "tooltip" contextual help overlay. The application presents the tooltip content from the printer's message catalog in an overlay while her mouse pointer remains over that label. Violet reads the tooltip and gains an understanding of the feature's meaning and chooses to use it.

3.2 Exceptions

There are no exception conditions for the use cases specified in section 3.1.

3.3 Out of Scope

The following are considered out of scope for this document:

1. Specifying the user interface for controls that present the IPP help content

3.4 Design Requirements

The design requirements for this document are:

1. Define additions to the IPP Message Catalog content syntax that allow the Printer to provide additional descriptions for options in the strings catalog;
2. Register all attributes and operations with IANA

The design recommendations for this document are:

1. Consider the user experiences the IPP attributes might support

4. Localization Message Catalog Format Extensions

The IPP Localization Message Catalog file format [PWG5100.13] can be used to provide localized string labels for IPP attributes and non-textual attribute values. In some cases, the user may want more information about a particular attribute or attribute value. This additional information, usually also being textual in nature, also requires localization. To preserve the existing semantics but create space for these new facilities, several keyword labels are defined below.

Label	Example	Value Contents Description
_tooltip	“attribute-name._tooltip” “attribute-name.enum-value._tooltip”	UTF-8 plain text content providing a brief description of the corresponding attribute or attribute value.
_helpurl	“attribute-name._helpurl” “attribute-name.enum-value._helpurl”	URL pointing to help content providing more detailed description of the corresponding attribute or attribute value.

As an example, a Printer that specifies two collections in its "media-col-ready", one that specifies 'stationery' for its "media-type " value, and the other that specifies 'smi32473-eco-lite' for its "finishing-template" value, can implement among others the following attributes and values (using "ipptoolfile" syntax):

```
ATTR collection media-col-ready
{
```



```
        MEMBER keyword media-type "stationery"
        MEMBER keyword media-source "auto"
        MEMBER collection media-size
        {
            # iso_a4_210x297mm
            MEMBER integer x-dimension 21000
            MEMBER integer y-dimension 29700
        }
        MEMBER integer media-top-margin 500
        MEMBER integer media-bottom-margin 500
        MEMBER integer media-left-margin 500
        MEMBER integer media-right-margin 500
    },{
        MEMBER keyword media-type "smi32473-eco-lite"
        MEMBER keyword media-source manual
        MEMBER keyword media-color white
        MEMBER collection media-size
        {
            # na_letter_8.5x11in
            MEMBER integer x-dimension 21590
            MEMBER integer y-dimension 27940
        }
        MEMBER integer media-bottom-margin 500
        MEMBER integer media-left-margin 500
        MEMBER integer media-right-margin 500
        MEMBER integer media-top-margin 500
    }
```

Its message catalog at /strings/ipp-en.strings would include the following (for en-us):

```
"media-type" = "Media Type";
"media-type.stationery" = "Stationery";
"media-type.stationery._tooltop" = "Conventional Stationery";
"media-type.stationery._helpurl" = "/_help/help-media-types.html";
"media-type.smi32473-eco-lite" = "PWG Eco Lite";
"media-type.smi32473-eco-lite._tooltop" = "Lightweight paper that may tear";
"media-type.smi32473-eco-lite._helpurl" = "/_help/help-media-types.html";
```

5. Internationalization Considerations

For interoperability and basic support for multiple languages, conforming implementations MUST support:

1. The Universal Character Set (UCS) Transformation Format -- 8 bit (UTF-8) [STD63] encoding of Unicode [UNICODE] [ISO10646]; and

2. The Unicode Format for Network Interchange [RFC5198] which requires transmission of well-formed UTF-8 strings and recommends transmission of normalized UTF-8 strings in Normalization Form C (NFC) [UAX15].

Unicode NFC is defined as the result of performing Canonical Decomposition (into base characters and combining marks) followed by Canonical Composition (into canonical composed characters wherever Unicode has assigned them).

WARNING – Performing normalization on UTF-8 strings received from Clients and subsequently storing the results (e.g., in Job objects) could cause false negatives in Client searches and failed access (e.g., to Printers with percent-encoded UTF-8 URIs now 'hidden').

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 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 Internet Printing Protocol/1.1 [STD92]

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

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[IANA-PEN] "Private Enterprise Numbers - SMI Network Management Private Enterprise Codes", Internet Assigned Numbers Authority (IANA), https://www.iana.org/assignments/enterprise-numbers/

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

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[STD63] F. Yergeau, "UTF-8, a transformation format of ISO 10646", RFC 3629/STD 63, November 2003, http://tools.ietf.org/html/rfc3629

[STD66] T. Berners-Lee, R. Fielding, L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", RFC 3986/STD 66, January 2005, http://tools.ietf.org/html/rfc3986

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[UAX9] Unicode Consortium, “Unicode Bidirectional Algorithm”, UAX#9, May 2018, https://www.unicode.org/reports/tr9

[UAX14] Unicode Consortium, “Unicode Line Breaking Algorithm”, UAX#14, May 2018, https://www.unicode.org/reports/tr14

[UAX15] M. Davis, M. Duerst, "Unicode Normalization Forms", Unicode Standard Annex 15, May 2018, https://www.unicode.org/reports/tr15

[UAX29] Unicode Consortium, “Unicode Text Segmentation”, UAX#29, May 2018, https://www.unicode.org/reports/tr29

[UAX31] Unicode Consortium, “Unicode Identifier and Pattern Syntax”, UAX#31, June 2018, https://www.unicode.org/reports/tr31

[UNICODE] Unicode Consortium, "Unicode Standard", Version 11.0.0, June 2018, https://www.unicode.org/versions/Unicode11.0.0/

[UTS10] Unicode Consortium, “Unicode Collation Algorithm”, UTS#10, May 2018, https://www.unicode.org/reports/tr10

[UTS35] Unicode Consortium, “Unicode Locale Data Markup Language”, UTS#35, March 2018, https://www.unicode.org/reports/tr35

[UTS39] Unicode Consortium, “Unicode Security Mechanisms”, UTS#39, May 2018, https://www.unicode.org/reports/tr39

7.2 Informative References

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8. Authors' Addresses

Primary author:

Smith Kennedy
HP Inc.
11311 Chinden Blvd.
Boise, ID 83714
smith.kennedy@hp.com

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

Mike Sweet - Apple Inc.

9. Change History

9.1 April 19, 2019

Initial revision extracted from initial draft of "IPP Custom Print Quality and Intent Extensions" (CUSTOMPQI).

