Title of Registration

Status: Initial

Abstract: This registration defines IPP attributes, values, and operations that do something really interesting. Provide an abstract for your registration here. Abstracts should be at most one paragraph long. Never call your registration a "standard" here, it is a registration. Registration documents are not standards-track but are instead used to more formally define new attributes, values, and (in limited cases) operations before approval by the IPP workgroup and registration with IANA.

This registration is available electronically at:

https://ftp.pwg.org/pub/pwg/general/templates/reg-template.docx

https://ftp.pwg.org/pub/pwg/ipp/wd/wd-auhor-title-yyyymmdd.docx

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Title: *Title of Registration*

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**Table of Contents**

1. Introduction 6

2. Terminology 6

2.1 Conformance Terminology 6

2.2 Other Terminology 7

2.3 Acronyms and Organizations 7

3. Requirements 8

3.1 Rationale for Title of Document 8

3.2 Use Cases 8

3.3 Exceptions 8

3.4 Out of Scope 8

3.5 Design Requirements 8

4. First Specification Section 8

5. Conformance Requirements 9

6. Internationalization Considerations 9

7. Security Considerations 9

8. IANA Considerations 9

9. References 9

9.1 Normative References 9

9.2 Informative References 9

10. Authors' Addresses 9

11. Change History 11

11.1 Month, DD, YYYY 11

List of Figures

Figure 1 - An Example Figure 4

List of Tables

Table 1 - An Example Table 4

1. Introduction

Provide an introduction for the document.

Figure 1 - An Example Figure

Table 1 - An Example Table Using the PWG Table Style

| Keyword | Description | Conformance |
| --- | --- | --- |
| One | The first keyword | REQUIRED |
| Two | The second keyword | OPTIONAL |

1. Terminology
	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 [BCP14]. This specification defines the following additional capitalized conformance terms:

*CONDITIONALLY REQUIRED*: A MUST conformance requirement that applies only when a specified condition is true.

*DEPRECATED*: A SHOULD NOT conformance requirement for previously defined and approved protocol elements that are planned to be removed from use.

*OBSOLETE*: A MUST NOT conformance requirement for previously defined and approved protocol elements that have been removed from use.

* 1. Printing Terminology

The following printing terms are used in this document:

*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 a Printer that contains the description, processing, and status information. A Document object may have attached data and is bound to a single Job [PWG5100.5].

*End User*: An End User is 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].

*Impression*: An Impression is the content imposed upon one side of a Media Sheet by a marking engine, independent of the number of times that the sheet side passes any marker. An Impression contains one or more Input Pages that are imposed (scaled, translated, and/or rotated) during processing of the Document data [STD92].

*Input Page*: An Input Page is a page according to the definition of "pages" in the language used to express the Document data [STD92].

*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 [STD92].

*Job Creation Operation*: A Job Creation operation is any operation that causes the creation of a Job object, e.g., the Create-Job, Print-Job, and Print-URI operations defined in this document [STD92].

*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 [STD92].

*Media Sheet*: A Media Sheet is a single instance of a medium, whether printing on one or both sides of the medium. Media Sheets also include sections of roll media [STD92].

*Operator*: An Operator is an End User that also has special rights on the Output Device or Printer. The Operator typically monitors the status of the Printer and also 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 [STD92].

*Physical Device*: a hardware implementation of an endpoint device, e.g., a marking engine, a fax modem, etc. [STD92]

*Set*: A Set is a logical boundary between the delivered Media Sheets of a printed Job. For example, in the case of a ten-page single Document with collated pages and a request for 50 copies, each of the 50 printed copies of the Document constitutes a Set. If the pages were uncollated, then 50 copies of each of the individual pages within the Document would represent each Set. Finishing processes operate on Sets [STD92].

*Terminating State*: The final state for a Job or other object is called its Terminating State. For example, the 'aborted', 'canceled', and 'completed' Job states are Terminating States [STD92].

* 1. Protocol Role Terminology

The following protocol roles are defined to specify unambiguous conformance requirements:

*Client*: Initiator of outgoing connections and sender of outgoing operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [STD99] User Agent) [STD92].

*Printer*: Listener for incoming connections and receiver of incoming operation requests (Hypertext Transfer Protocol -- HTTP/1.1 [STD99] Server) that represents one or more Physical Devices or a Logical Device [STD92].

* 1. Other Terminology

This specification defines the following terms:

*Capitalized Term In Italics*: definition of the term with any references as appropriate.

* 1. Acronyms and Organizations

This specification defines the following acronyms and organizations:

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

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

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

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

1. Requirements
	1. Rationale

Given the following existing specifications:

1. Title of First Specification [REFERENCE1]
2. Title of Second Specification [REFERENCE2]
3. ...
4. Title of Nth Specification [REFERENCEN]

And given the need for WHAT YOU NEED, the TITLE OF REGISTRATION should:

1. Provide foo,
2. Define bar, and
3. Define bla.
	1. Use Cases

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

* 1. Exceptions

The following subsections define exceptions in addition to those defined in the Internet Printing Protocol/1.1 [STD92].

Provide exceptions for the use cases using the casual use case format.

* 1. Out of Scope

The following are considered out of scope for this registration:

1. Definition of new file formats; and
2. Definition of new protocol bindings.
	1. Design Requirements

The design requirements for this registration are:

1. Define attributes and values to describe ...;
2. Define operations for ...;
3. Define security requirements necessary to support ...; and
4. Define sections to register all attributes, values, and operations with IANA.

The design recommendations for this registration are:

1. Support additional "nice to have" use cases
2. Model

Provide detailed information starting in section 4. Attributes, values, and operations are defined in later sections.

1. New Operations

Note: New operations with complex semantics will likely require a standards-track document and not a simple registration to be given a non-vendor operation code.

* 1. Operation-Name

This OPTIONAL/RECOMMENDED/CONDITIONALLY REQUIRED operation ... [CONDITIONALLY REQUIRED ONLY] A Printer that supports Named Feature MUST support this operation.

[ADMIN OPERATIONS ONLY] Access Rights: The authenticated user [STD92] performing this operation MUST be an Operator or Administrator of the Printer. Otherwise, the Printer MUST reject the operation and return 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

[JOB OPERATIONS ONLY] Access Rights: The authenticated user [STD92] performing this operation MUST be the Job owner or an Operator or Administrator of the Printer. Otherwise, the Printer MUST reject the operation and return 'client-error-forbidden', 'client-error-not-authenticated', or 'client-error-not-authorized' as appropriate.

* + 1. Operation-Name Request

The following groups of attributes are part of an Operation-Name request:

Group 1: Operation Attributes

"attributes-charset" (charset) and
"attributes-natural-language" (naturalLanguage):

The Client MUST supply and the Printer MUST support both of these attributes.

Target:

[PRINTER OPERATIONS] The "printer-uri" (uri) operation attribute which is the target Printer for the operation.

[JOB OPERATIONS] The "printer-uri" (uri) and "job-id" (integer) operation attributes which are the target Job for the operation.

[SYSTEM OPERATIONS] The "system-uri" (uri) operation attribute which is the target System for the operation.

"attribute name" (syntax):

The Client MUST/MAY supply and the Printer/System MUST support ...

[AS NEEDED] Group N: Document/Job/Printer/System Attributes

"attribute-name" (syntax):

The Client MUST/MAY supply and the Printer/System MUST support ...

* + 1. Operation-Name Response

The following groups of attributes are part of an Operation-Name response:

Group 1: Operation Attributes

"attributes-charset" (charset) and
"attributes-natural-language" (naturalLanguage):

The Printer MUST return both of these attributes.

"status-message" (text(255)) and/or
"detailed-status-message" (text(MAX)):

The Printer MAY return one or both of these attributes.

Group 2: Unsupported Attributes

See [STD92] for details on returning Unsupported Attributes.

[AS NEEDED] Group N: Document/Job/Printer/System Attributes

"attribute-name" (syntax):

The Printer/System MAY/MUST return ...

1. New Attributes
	1. Operation Attributes
		1. attribute-name (syntax)
	2. Document Description Attributes
		1. attribute-name (syntax)
	3. Document Status Attributes
		1. attribute-name (syntax)
	4. Document Template Attributes
		1. attribute-name (syntax)
	5. Job Description Attributes
		1. attribute-name (syntax)
	6. Job Status Attributes
		1. attribute-name (syntax)
	7. Job Template Attributes
		1. attribute-name (syntax)
	8. Printer Description Attributes
		1. attribute-name (syntax)
	9. Printer Status Attributes
		1. attribute-name (syntax)
2. New Values for Existing Attributes
	1. attribute-name (syntax)

Note: Registration documents cannot define additional semantics for (extensions to) existing operations defined in a specification - that requires a standards track document.

1. Conformance Requirements
	1. Printer Conformance Requirements

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

1. The required attributes and values defined in section ??;
2. The required operations defined in section ??;
3. The additional values defined in section ??;
4. The internationalization considerations defined in section 6; and
5. The security considerations defined in section 7.
	1. Client Conformance Requirements

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

1. The required attributes and values defined in section ??;
2. The required operations defined in section ??;
3. The additional values defined in section ??;
4. The internationalization considerations defined in section 6; and
5. The security considerations defined in section 7.
6. Internationalization Considerations

Tailor the following standard 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

1. Security and Privacy Considerations

Provide security and privacy considerations for this specification, such as the following.

The IPP extensions defined in this document require the same security and privacy 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

1. IANA Considerations
	1. Attribute Registrations

The attributes defined in this registration will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

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

The registry entries will contain the following information:

Document Description attributes: Reference

-------------------------- ---------

name (type) [REFERENCE]

Document Status attributes: Reference

-------------------------- ---------

name (type) [REFERENCE]

Document Template attributes: Reference

-------------------------- ---------

name (type) [REFERENCE]

Job Description attributes: Reference

-------------------------- ---------

name (type) [REFERENCE]

Job Status attributes: Reference

-------------------------- ---------

name (type) [REFERENCE]

Job Template attributes: Reference

-------------------------- ---------

name (type) [REFERENCE]

Operation attributes: Reference

-------------------- ---------

name (type) [REFERENCE]

Printer Description attributes: Reference

------------------------------ ---------

name (type) [REFERENCE]

Printer Status attributes: Reference

------------------------------ ---------

name (type) [REFERENCE]

Subscription Description attributes: Reference

------------------------------ ---------

name (type) [REFERENCE]

Subscription Status attributes: Reference

------------------------------ ---------

name (type) [REFERENCE]

Subscription Template attributes: Reference

------------------------------ ---------

name (type) [REFERENCE]

* 1. Type2 keyword Registrations

The attributes defined in this registration will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

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

The registry entries will contain the following information:

Attributes (attribute syntax)

 Keyword Attribute Value Reference

 ----------------------- ---------

name (type2 keyword) [REFERENCE]

 value-1 [REFERENCE]

 value-2 [REFERENCE]

name-supported (1setOf type2 keyword) [REFERENCE]

 < all name values > [REFERENCE]

* 1. Type2 enum Registrations

The attributes defined in this registration will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

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

The registry entries will contain the following information:

Attributes (attribute syntax)

 Enum Value Enum Symbolic Name Reference

 ---------- ------------------ ---------

name (type2 enum) [REFERENCE]

 3 value-3 [REFERENCE]

 4 value-4 [REFERENCE]

operations-supported (1setOf type2 enum) [RFC8011]

 0xXXXX Operation-Name [REFERENCE]

* 1. Operation Registrations

The attributes defined in this registration will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

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

The registry entries will contain the following information:

Operation Name Reference

-------------- ---------

Operation-Name [REFERENCE]

* 1. Status Code Registrations

The attributes defined in this registration will be published by IANA according to the procedures in the Internet Printing Protocol/1.1 [STD92] in the following file:

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

The registry entries will contain the following information:

Value Status Code Name Reference

------ --------------------------------------------- ---------

0x0400:0x04FF - Client Error:

 0x04XX client-error-name [REFERENCE]

0x0500:0x05FF - Server Error:

 0x05XX server-error-name [REFERENCE]

1. References
	1. Normative References

[REFERENCE] F. Last author list or standards body, "Title of referenced document", Document Number, Month YYYY, URL (if any)

[BCP14] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119/BCP 14, March 1997, <https://datatracker.ietf.org/doc/html/rfc2119>

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[PWG5100.5] M. Sweet, "IPP Document Object v1.1 (DOCOBJECT)", PWG 5100.5-2019, May 2019, <https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject11-20190521-5100.5.pdf>

[RFC5198] J. Klensin, M. Padlipsky, "Unicode Format for Network Interchange", RFC 5198, March 2008, <https://datatracker.ietf.org/doc/html/rfc5198>

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

[STD92] M. Sweet, I. McDonald, "Internet Printing Protocol/1.1", RFC 8010/RFC 8011/STD 92, June 2018, <https://datatracker.ietf.org/doc/html/rfc8010>, <https://datatracker.ietf.org/doc/html/rfc8011>

[STD99] R. Fielding, J. Reschke, "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing", RFC 9112/STD 99, June 2022, <https://datatracker.ietf.org/doc/html/rfc9112>

[UAX9] Unicode Consortium, “Unicode Bidirectional Algorithm”, UAX#9, August 2021, <https://www.unicode.org/reports/tr9>

[UAX14] Unicode Consortium, “Unicode Line Breaking Algorithm”, UAX#14, August 2021, <https://www.unicode.org/reports/tr14>

[UAX15] M. Davis, M. Duerst, "Unicode Normalization Forms", Unicode Standard Annex 15, August 2021, <https://www.unicode.org/reports/tr15>

[UAX29] Unicode Consortium, “Unicode Text Segmentation”, UAX#29, August 2021, <https://www.unicode.org/reports/tr29>

[UAX31] Unicode Consortium, “Unicode Identifier and Pattern Syntax”, UAX#31, August 2021, <https://www.unicode.org/reports/tr31>

[UNICODE] Unicode Consortium, "Unicode Standard", Version 14.0.0, September 2021, <https://www.unicode.org/versions/Unicode14.0.0/>

[UTS10] Unicode Consortium, “Unicode Collation Algorithm”, UTS#10, August 2021, <https://www.unicode.org/reports/tr10>

[UTS35] Unicode Consortium, “Unicode Locale Data Markup Language”, UTS#35, October 2021, <https://www.unicode.org/reports/tr35>

[UTS39] Unicode Consortium, “Unicode Security Mechanisms”, UTS#39, August 2021, <https://www.unicode.org/reports/tr39>

* 1. Informative References

[REFERENCE] F. Last author list or standards body, "Title of referenced document", Document Number, Month YYYY, URL (if any)

[RFC2567] F.D. Wright, "Design Goals for an Internet Printing Protocol", RFC 2567, April 1999, <https://datatracker.ietf.org/doc/html/rfc2567>

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

[UTR23] Unicode Consortium “Unicode Character Property Model”, UTR#23, September 2021, <https://www.unicode.org/reports/tr23>

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

[UNISECFAQ] Unicode Consortium “Unicode Security FAQ”, November 2016,
<https://www.unicode.org/faq/security.html>

1. Authors

Primary authors (using Address style):

John Doe

Example Company

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

Turanga Leela - Planet Express

Zapp Brannigan - Democratic Order of Planets

1. Change History

This section will be removed when this document is published.

* 1. Month, DD, YYYY

Initial revision.