The Printer Working Group

1 **IPP Job Save Password**
2 **(SAVEPASSWORD)**

3 Status: Interim

4 Abstract: This document is a whitepaper that proposes the creation of a new "save-
5 password" Job Template attribute that provides the Job with a persistent password that will
6 need to be provided when initially printing or re-printing that Job.

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 http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-savepassword-20180205.odt
11 http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-savepassword-20180205.pdf

13   Title: IPP Job Save Password *(SAVEPASSWORD)*

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1   Introduction

Users and network administrators are increasingly concerned about network and data security, and this extends to printing. Most all Users are familiar with sending a Job to a Printer and the Printer processing that Job fairly immediately, and some do so using a "job password" that prevents the Job from being processed until the User provides that password on the Printer's control panel to approve its release to processing. The IPP "job-password" operation attribute [PWG5100.11] and related attributes provide support for this workflow. Some Printers also support saving jobs for later printing or re-printing. In certain cases there may be Users that wish to take advantage of both capabilities. Unfortunately however, since "job-password" is an operation attribute, and that Job's processing is the act of saving the Job, the "job-password" attribute does not persist beyond its being saved. Therefore, to support scenarios involving a password protected saved job, new attributes need to be defined that convey a Job password that persists beyond Job processing completion.

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   Other Terms Used in This Document

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

2.3   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 Job Save Password

3.1   Use Cases

3.1.1   Protecting a Saved Document with a Persistent Password

Wilma has written a document that she intends to save on her departmental MFD, to allow some of her peers to print copies as needed. But as the document contains sensitive information, Wilma wishes to only allow those who know the job's password to re-print copies. She is familiar with providing a password when configuring a print job, and she is also familiar with configuring the job to be saved in the printer. In the print dialog used to configure the print job on her computer, Wilma provides a password, and also chooses to have the job saved. Wilma clicks "Print" and the computer submits the job to the printer. The printer saves the job content and protects it with the password provided.

3.1.2   Re-printing a Saved Job Via Printer Control Panel

Barney hears from Wilma that she has saved that document to the departmental MFD. Wilma tells Barney the job's name, and Barney then goes to the MFD and looks up the job. He taps on the control panel to have a copy printed, and is prompted to enter the job's password. He enters that on the control panel, and the MFD prints a copy. Barney collects it from the output bin and returns to his desk.

3.1.3   Re-printing a Saved Job Using An IPP Client

Barney sends an IM to Betty that Wilma has saved a job on the departmental MFD. Betty opens her computer's print system and browses the saved jobs on the MFD. She selects the job and clicks "Print" to have a copy made for her. A dialog is presented asking for the job's password. Betty types in the job's password, and the MFD prints a copy. She collects it from the MFD and returns to her office.

3.2   Exceptions

Harvey, an employee from another department, walks up to Wilma's departmental MFD. The .

3.3   Out of Scope

The following are considered out of scope for this document:

1. How the Document or Documents in a Job are stored by the Printer
2. Methods for encrypting the document itself.
3. Mechanisms for supporting per-user credentials / access control list for releasing the stored job.

118 **3.4 Design Requirements**

119 The design requirements for this document are:

120 1. Use existing attributes or collections if possible.
121 2. Support at the least the fidelity supported currently by "job password" and "job-
122   password-encryption"
123 3. Register all attributes and operations with IANA

124 The design recommendations for this document are:

125 1. Reusing UI controls with similar enough purposes so that the user doesn't need
126   to be confused by e.g. needing to interact with different controls for different
127   kinds of passwords.

128 **4 Printer Description Attributes**

129 **4.1 save-password-supported (rangeOfInteger(0:255))**

130 The "save-password" Printer Description attribute specifies whether the Printer supports
131 the persistent Job password specified by the "save-password" Job Template attribute, and
132 if so, what range of lengths the Printer's password policy requires for the unencrypted
133 value of "save-password". If the Client allows the User to provide it with an unencrypted
134 password value shorter than the lower bounds of "save-password-supported", the behavior
135 is undefined but the Job may never print.

136 **4.2 save-password-encryption-supported (1setOf (type2 keyword))**

137 The "save-password-encryption-supported" Printer Description attribute specifies the
138 encryption formats supported by the Printer for encrypting "save-password". Any of the
139 keywords registered for the "job-password-encryption" attribute may be listed in the "save-
140 password-encryption-supported" attribute, except for the keyword 'none' and all the
141 keywords that are deprecated by the PWG in the IANA IPP Registry [IANA-IPP] as of this
142 writing: 'sha', 'md2', 'md4', 'md5'. The 'sha3-256' encryption hashing algorithm MUST be
143 supported if this attribute is supported, to ensure interoperability between implementations.
144 This attribute MUST be supported if the "save-password" member attribute of "job-save-
145 disposition" is supported.

146 **4.3 save-password-repertoire-configured (1setOf (type2 keyword))**

147 The "save-password-repertoire-configured" Printer Description attribute specifies the set of
148 repertoires the Printer is configured to accept for a Job's "save-password-repertoire"
149 attribute. The values specified by "save-password-repertoire-configured" MUST be present
150 in the set of keyword values specified by "save-password-repertoire-supported".

4.4 save-password-repertoire-supported (1setOf (type2 keyword))

The "save-password-repertoire-supported" Printer Description attribute specifies the range of repertoires the Printer supports that may be configured for listing in the Printer's "save-password-repertoire-configured" attribute. All keywords specified in the "save-password-repertoire-supported" must be registered in the IANA IPP Registry [IANA-IPP] for the "job-password-repertoire" attribute [IPPREPERTOIRE]. The 'iana_utf-8_any' keyword MUST be supported if this attribute is supported. This attribute MUST be supported if the "save-password-repertoire" member attribute of "job-save-disposition" is supported.

5 Additional Values and Semantics for Existing Attributes

5.1 job-save-disposition Member Attributes

This specification defines several new "job-save-disposition" member attributes to support the specification of a Job Save Password.

5.1.1 save-password (octetString(1024))

The "save-password" member attribute specifies a password for the Job, which is semantically analogous to the "job-password" Operation attribute [PWG5100.11]. The Printer MUST NOT process the Job unless a User provides a password value that matches the value stored in "save-password" to authorize the Printer to allow its release. This member attribute MUST be present if the "save-password-encryption" member attribute is present.

The maximum length of this attribute is greater than the length of "save-password-supported" because this attribute needs to accommodate encrypted passwords which have longer fixed lengths.

5.1.2 save-password-encryption (type2 keyword)

The "save-password-encryption" Job Template attribute specifies the hashing algorithm the Client employed to obfuscate the password value specified in the "save-password" Job Template attribute. This member attribute MUST be present if the "save-password" member attribute is present. The value held by "save-password-encryption" MUST be one of the values in the "save-password-encryption-supported" Printer Description attribute.

5.1.3 save-password-repertoire (type2 keyword)

The "save-password-repertoire" Job Template attribute specifies the repertoire selected for the "save-password" attribute. This member attribute MUST be present if the "save-password" member attribute is present. The value held by "save-password-repertoire" MUST be one of the values in the "save-password-repertoire-supported" Printer Description attribute.

185 6   Internationalization Considerations

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

205 7   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], IPP: Job and Printer Extensions – Set 2 (JPS2), and IPP Job Password Repertoire, plus additional security considerations below.

210 7.1 Human-readable Strings

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

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

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

216   • Unicode Security FAQ [UNISECFAQ] – common Unicode security issues

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10 Change History

10.1 February 5, 2018

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10.2 December 5, 2017

Initial revision.