



The Printer Working Group

February 5, 2018
White Paper

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

3 Status: ~~Interim~~**Initial**

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-20171205.odt>

12 <http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-savepassword-20180205.pdf>

13 <http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-savepassword-20171205.pdf>

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15 Title: IPP Job Save Password (SAVEPASSWORD)

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59 1 Introduction

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

73 ~~Users and network administrators are increasingly concerned about network and data~~
74 ~~security, and this extends to printing. Most all Users are familiar with sending a Job to a~~
75 ~~Printer and the Printer processing that Job fairly immediately, and some do so using a “job~~
76 ~~password” that prevents the Job from being processed until the User provides that~~
77 ~~password on the Printer's control panel to approve its release to processing. The IPP “job-~~
78 ~~password” Job Template attribute [PWG5100.11] and related attributes provide support for~~
79 ~~this workflow. Some Printers also support saving jobs for later re-print. Some Users wish to~~
80 ~~take advantage of both capabilities; however, since “job-password” is a Job Template~~
81 ~~attribute, and the act of saving the Job is considered that Job's processing, the “job-~~
82 ~~password” attribute does not persist beyond its being saved. What is needed to support a~~
83 ~~password protected saved job is an attribute that persists beyond the conclusion of the~~
84 ~~Job, such as a Document Description attribute.~~

85 Terminology

86 1.1 Protocol Roles Terminology

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

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

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

94 **1.2 Other Terms Used in This Document**

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

96 **1.3 Acronyms and Organizations**

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

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

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

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

101 Requirements for IPP Job Save Password

102 **1.4 Rationale for IPP Job Save Password**

103 ~~2 Users and network administrators are increasingly concerned about network and~~
104 ~~data security, and this extends to printing. Most all Users are familiar with sending a Job to~~
105 ~~a Printer and the Printer processing that Job fairly immediately, and some do so using a~~
106 ~~“job password” that prevents the Job from being processed until the User provides that~~
107 ~~password on the Printer's control panel to approve its release to processing. The IPP “job-~~
108 ~~password” Job Template attribute [PWG5100.11] and related attributes provide support for~~
109 ~~this workflow. Some Printers also support saving jobs for later printing or re-printing. Some~~
110 ~~Users wish to take advantage of both capabilities; however, since “job-password” is a Job~~
111 ~~Template attribute, and the act of saving the Job is considered that Job's processing, the~~
112 ~~“job password” attribute does not persist beyond its being saved. What is needed to~~
113 ~~support a password protected saved job is an attribute that persists beyond the conclusion~~
114 ~~of the Job, such as a Document Description attribute.~~

115 | 2.1 Use Cases

116 | 2.1.1 Protecting Printing a Saved Document with a Persistent Password

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

127 | 2.1.2 Re-printing a Saved Job Via Printer Control Panel

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

133 | 2.1.3 Re-printing a Saved Job Using An IPP Client

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

139 | 2.2 Exceptions

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

142 ~~There are currently no exceptions.~~

143 | Out of Scope

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

- 145 1. How the Document or Documents in a Job are stored by the Printer
- 146 2. Methods for encrypting the document itself.
- 147 3. Mechanisms for supporting per-user credentials / access control list for releasing
148 the stored job.
- 149 4. ~~Protocols for bar~~

150 | 3 ~~Requirements for bla~~
151 | 5. Design Requirements

152 | The design requirements for this document are:

- 153 | 1. ~~Use existing attributes or collections if possible.~~
154 | 2. ~~Support at the least the fidelity supported currently by “job password” and “job-~~
155 | ~~password-encryption”~~
156 | 3. ~~Register all attributes and operations with IANA~~
157 | 4. ~~Define attributes for foo and bar~~
158 | 6. ~~Define operations for bla~~
159 | 7. ~~Register all attributes and operations with IANA~~
160 | 5. The design recommendations for this document are:
161 | 1. Reusing UI controls with similar enough purposes so that the user doesn't need
162 | to be confused by e.g. needing to interact with different controls for different
163 | kinds of passwords.

164 | **4 Printer Description Attributes**

165 | **5 IPP Attributes**

166 | **5.1 Printer Description Attributes**

167 | **6 save-password-supported (rangeOfInteger(0:255))**

168 | The “save-password” Printer Description attribute specifies whether the Printer supports
169 | the persistent Job password specified by the “save-password” Job Template attribute, and
170 | if so, what range of lengths the Printer's password policy requires for the unencrypted
171 | value of “save-password”. If the Client allows the User to provide it with an unencrypted
172 | password value shorter than the lower bounds of “save-password-supported”, the behavior
173 | is undefined but the Job may never print.

174 | **6.1 save-password-encryption-supported (1setOf (type2 keyword))**

175 | The “save-password-encryption-supported” Printer Description attribute specifies the
176 | encryption formats supported by the Printer for encrypting “save-password”. Any of the
177 | keywords registered for the “job-password-encryption” attribute may be listed in the “save-
178 | password-encryption-supported” attribute, except for the keyword 'none' and all the
179 | keywords that are deprecated by the PWG in the IANA IPP Registry [IANA-IPP] as of this
180 | writing: 'sha', 'md2', 'md4', 'md5'. The 'sha3-256' encryption hashing algorithm MUST be
181 | supported if this attribute is supported, to ensure interoperability between implementations.
182 | This attribute MUST be supported if the “save-password” member attribute of “job-save-
183 | disposition” is supported.

184 **6.2 save-password-repertoire-configured (1setOf (type2 keyword))**

185 The “save-password-repertoire-configured” Printer Description attribute specifies the set of
186 repertoires the Printer is configured to accept for a Job's “save-password-repertoire”
187 attribute. The values specified by “save-password-repertoire-configured” MUST be present
188 in the set of keyword values specified by “save-password-repertoire-supported”.

189 ~~The “save-password-repertoire-configured” Printer Description attribute specifies the set of~~
190 ~~repertoires the Printer is configured to accept for a Job's “save-password-repertoire”~~
191 ~~attribute. The values specified in “save-password-repertoire-configured” MUST be listed in~~
192 ~~“save-password-repertoire-supported”.~~

193 **save-password-repertoire-supported (1setOf (type2 keyword))**

194 The “save-password-repertoire-supported” Printer Description attribute specifies the range
195 of repertoires the Printer supports that may be configured for listing in the Printer's “save-
196 password-repertoire-configured” attribute. All keywords specified in the “save-password-
197 repertoire-supported” must be registered in the IANA IPP Registry [IANA-IPP] for the “job-
198 password-repertoire” attribute [IPPREPertoire]. The 'iana_utf-8_any' keyword MUST be
199 supported if this attribute is supported. This attribute MUST be supported if the “save-
200 password-repertoire” member attribute of “job-save-disposition” is supported.

201 **7 Additional Values and Semantics for Existing Attributes**

202 **7.1 job-save-disposition Member Attributes**

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

205 ~~The “save-password-repertoire-supported” Printer Description attribute specifies the range~~
206 ~~of repertoires the Printer supports that may be configured for listing in the Printer's “save-~~
207 ~~password-repertoire-configured” attribute. The keywords specified in the “save-password-~~
208 ~~repertoire-supported” keywords must be defined and registered in the PWG for the “job-~~
209 ~~password-repertoire” attribute Error: Reference source not found.~~

210 **7.2 Job Template Attributes**

211 **save-password (octetString(1024255))**

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

218 | ~~The maximum length of this attribute is greater than the length of “save-password-~~
219 | ~~supported” because this attribute needs to accommodate encrypted passwords which~~
220 | ~~have longer fixed lengths.~~

221 | ~~The “save-password” Job Template attribute specifies a password for the Job, which is~~
222 | ~~semantically analogous to the “job-password” Operation attribute [PWG5100.11]. The~~
223 | ~~Printer MUST NOT process the Job unless a User provides the “save-password” to~~
224 | ~~authorize the Printer to allow its release. The “save-password” attribute MUST persist with~~
225 | ~~the Job, even when the Job persists as a “saved job” [PWG5100.11].~~

226 | ~~The Client MUST provide the “job-save-disposition” Job Template attribute when it~~
227 | ~~provides the “save-password” attribute.~~

228 | save-password-encryption (type2 keyword)

229 | ~~The “save-password-encryption” Job Template attribute specifies the hashing algorithm the~~
230 | ~~Client employed to obfuscate the password value specified in the “save-password” Job~~
231 | ~~Template attribute. This member attribute MUST be present if the “save-password”~~
232 | ~~member attribute is present. The value held by “save-password-encryption” MUST be one~~
233 | ~~of the values in the “save-password-encryption-supported” Printer Description attribute.~~

234 | ~~The “save-password-encryption” Job Template attribute specifies the encryption type the~~
235 | ~~Client employed to encrypt the password value specified in the “save-password” Job~~
236 | ~~Template attribute. This attribute MUST be present if the “save-password” attribute is~~
237 | ~~present.~~

238 | save-password-repertoire (type2 keyword)

239 | ~~The “save-password-repertoire” Job Template attribute specifies the repertoire selected for~~
240 | ~~the “save-password” attribute. This member attribute MUST be present if the “save-~~
241 | ~~password” member attribute is present. The value held by “save-password-repertoire”~~
242 | ~~MUST be one of the values in the “save-password-repertoire-supported” Printer~~
243 | ~~Description attribute.~~

244 | ~~The “save-password-repertoire” Job Template attribute specifies the repertoire selected for~~
245 | ~~the “save-password” attribute. This attribute MUST be present if the “save-password”~~
246 | ~~attribute is present.~~

247 | Internationalization Considerations

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

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

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

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

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

267 **8 Security Considerations**

268 The IPP extensions defined in this document require the same security considerations as
269 defined in the IPP/1.1: Model and Semantics [RFC8011], [IPP: Job and Printer Extensions](#)
270 [– Set 2 \(JPS2\), and IPP Job Password Repertoire.](#), plus additional security considerations
271 below.

272 **8.1 Human-readable Strings**

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

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

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

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

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372 Zapp Brannigan - Democratic Order of Planets
373 Wowbanger The Infinitely Prolonged – Independent Consultant
374 Ira McDonald – High North Inc.

375 **11 Change History**

376 | **11.1 February 5, 2018**

377 | Updated as per feedback from Dec. 14, 2017 IPP WG teleconference review:

-

378 | **11.2 December 5, 2017**

379 Initial revision.