



The Printer Working Group

November 3, 2017  
IPP Registration

1 **IPP Get-User-Printer-Attributes**  
2 **(GUPA)**

3 Status: Stable

4 Abstract: This registration defines the Get-User-Printer-Attributes IPP operation, which  
5 allows an IPP Client to retrieve the Printer's attributes and capabilities that are available  
6 specifically to the Client's most authenticated User.

7 This document is available electronically at:

8 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/wd-ippgupa-20171103.odt>  
9 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/wd-ippgupa-20171016.odt>  
10 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/wd-ippgupa-20171103.pdf>  
11 <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/wd-ippgupa-20171016.pdf>

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13 Title: *IPP Get-User-Printer-Attributes (GUPA)*

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## 60 **1 Introduction**

61 | This [IPP Registration document](#) defines the Get-User-Printer-Attributes IPP operation,  
62 which allows an IPP Client to retrieve the Printer's attributes and capabilities that are  
63 available specifically to the Client's most authenticated User. It is semantically analogous  
64 to the existing Get-Printer-Attributes IPP operation [RFC8011], with the key difference that  
65 the Printer could respond with an authentication challenge.

## 66 **2 Terminology**

### 67 **2.1 Protocol Roles Terminology**

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

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

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

### 75 **2.2 Other Terms Used in This Document**

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

### 77 **2.3 Acronyms and Organizations**

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

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

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

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

## 82 **3 Requirements**

### 83 **3.1 Rationale**

84 While there are many ~~proprietary solutions, both standard and non-standard, for creating~~  
85 print policy ~~solutionies~~ that provide a way to specify allowed or disallowed features  
86 according to individual users, systems, applications, and so forth, there is no established  
87 ~~standard~~ method using IPP. ~~IPP ecosystems would benefit from h~~Having ~~such~~ a print  
88 policy method ~~tousing IPP would~~ better support systems such as IPP Everywhere™  
89 [PWG5100.14] in print infrastructures provided by public print providers, enterprises or  
90 ~~educational environments such as~~ university settings.

91 Technical justification for pursuing the creation of a new IPP operation rather than reusing  
92 or overloading existing operations such as Get-Printer-Attributes is discussed in section 4.

### 93 **3.2 Use Cases**

94 The need for solutions to these use cases emerged during the process of writing the IPP  
95 Implementor's Guide v2 [PWG5100.19].

#### 96 **3.2.1 Print Policy For Some Users Limits Print Capabilities**

97 Sue wants to print her report on her department's workgroup printer. She wants to print it in  
98 color to make the color graphs look best. However, she has abused her printing privileges,  
99 so her department head has instructed the network administrator to restrict her user  
100 account's ability to print in color.

101 Sue opens the document on her laptop, chooses to print, and selects the department's  
102 workgroup printer. The Printer authenticates the laptop using Sue's credentials, and then  
103 provides the laptop with the print choices available for Sue's account, which does not  
104 include color printing. Sue decides whether to print it in black-and-white anyway or to print  
105 from one of the campus print centers, where she can pay to print in color.

106 Bob is an associate professor in the same department as Sue. His account has no  
107 limitations for color printing. He opens a document on his tablet, taps to print, and selects  
108 the department's workgroup printer. His tablet presents print options including the option of  
109 printing in color. Bob chooses to print in color, and prints his document, which prints in  
110 color as he expects.

111 Figure 3.1 illustrates this use case with a sequence diagram.

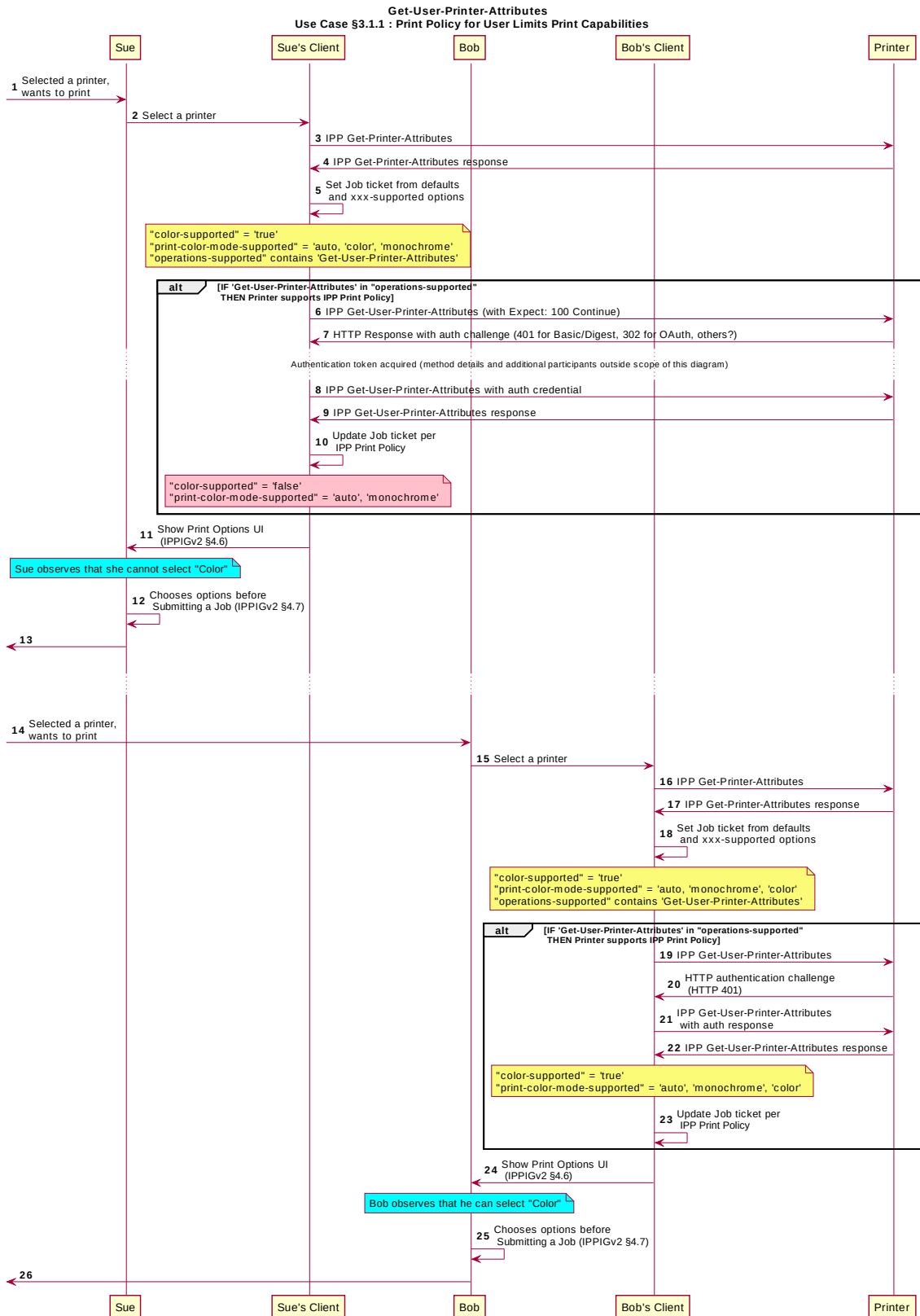


Figure 3.1 : Use Case 3.1.1 Sequence Diagram

### 112 3.2.2 User Not Listed in Print Policy Denied Ability to Print in Color

113 In this use case, a user who is not named in the print policy system is denied the ability to  
114 print using existing conventional IPP print protocol use. The Client **mightmay** implement  
115 support for IPP Print Policy but authentication **couldmay** fail, or the Client **mightmay** have  
116 not implemented support for IPP Print Policy.

117 Duncan is at the office and needs to print a 5 page report that contains color diagrams  
118 before his next meeting. His office user account has been granted permission by his office  
119 network administrator to print in color. Duncan opens the document on his tablet, taps to  
120 print, and selects the desired Printer. The tablet fetches the Printer's default capabilities,  
121 and then authenticates using Duncan's user account to retrieve the print options available  
122 to him as per his account's print policy, including the option to print in color or  
123 monochrome. He prints the document using the color option, retrieves the hardcopy from  
124 the printer, and then goes on to his meeting.

125 Ed is visiting Duncan's office and needs to print a 3 page document. Ed is not listed as a  
126 user in the print policy. Ed opens the document on his laptop, clicks to print, and selects  
127 the Printer **Duncan pointrecommended out to himby Duncan**. The laptop does not support  
128 print policies or does but has no valid credentials. The Printer provides Ed's laptop with the  
129 default print capabilities. When the Job is submitted to the Printer, the Printer rejects the  
130 Job or identifies the setting that were adjusted, since unknown users don't have the right to  
131 print in color on this printer.

132 Figure 3.2 illustrates this use case with a sequence diagram.

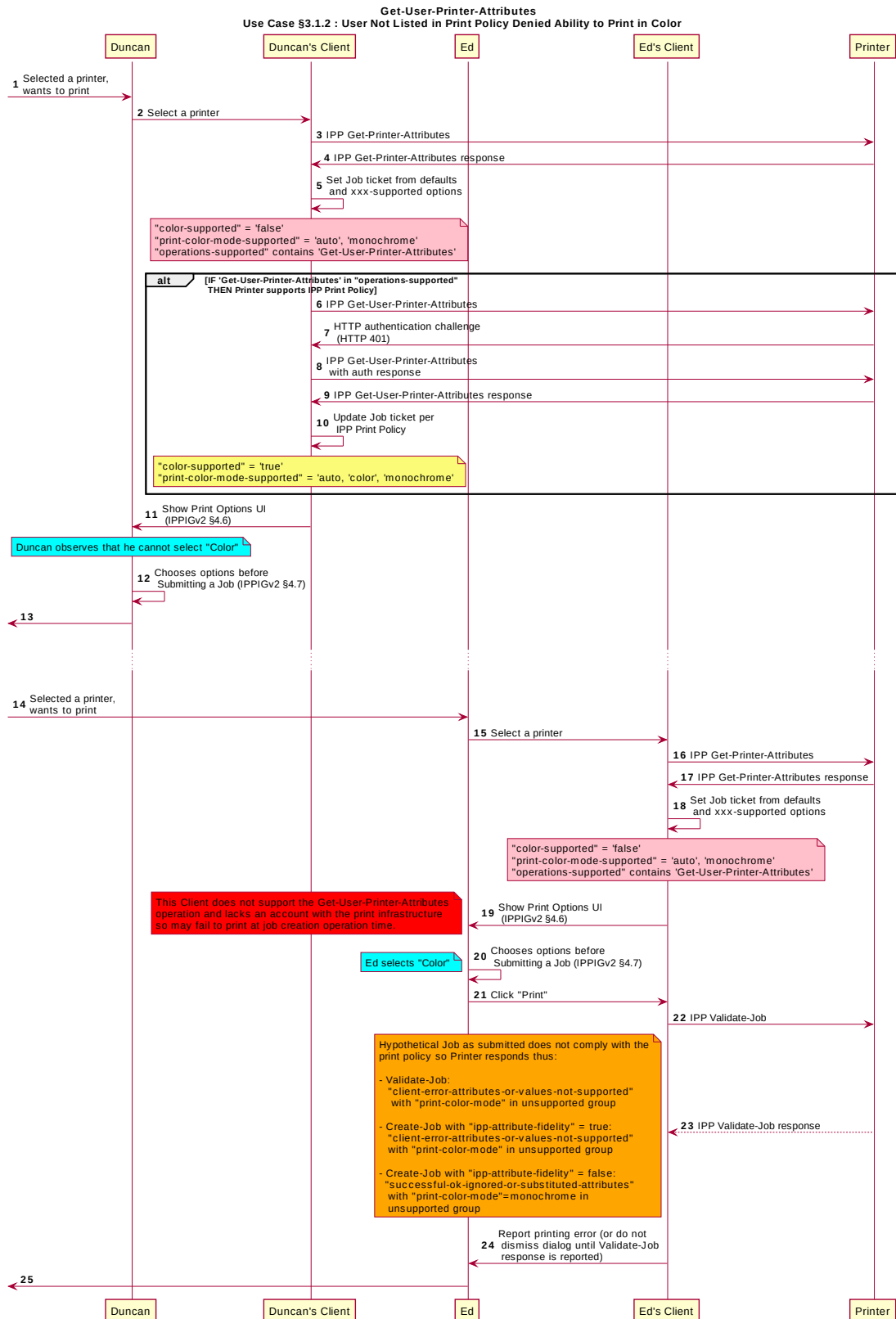


Figure 3.2 : Use Case 3.1.2 Sequence Diagram



### 133 3.3 Exceptions

134 There are no exceptions to the use cases in section 3.2.

### 135 3.4 Out of Scope

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

- 137 1. Definition of specific print policies.
- 138 2. Definition of how print policy management systems structure and/or organize the
- 139 sets of users and their policies.
- 140 3. Definition of non-IPP protocols that can provide similar functionality.

### 141 3.5 Design Requirements

142 The design requirements for this registration are:

- 143 1. Define an IPP operation to allow a Client to obtain supported Printer capabilities
- 144 for a given User.
- 145 2. Document interoperability requirements for Clients and Printers.
- 146 3. Define security requirements necessary to support the newly defined operations.
- 147 4. Define sections to register all attributes, values, and operations with IANA.

148 The design recommendations for this document are:

- 149 1. Recommend suitable authentication methods and guidelines for the use of those
- 150 methods and provide guidance for Client user interfaces.

## 151 4 Get-User-Printer-Attributes Operation

152 The Get-User-Printer-Attributes operation is semantically analogous to the Get-Printer-  
153 Attributes operation [RFC8011] but can be authenticated and ~~filters~~ the response **can be**  
154 **filtered** based on the most authenticated user. The Client MUST be prepared to handle an  
155 HTTP authentication challenge in response to a Get-User-Printer-Attributes operation  
156 request. If the Client initiates the Get-User-Printer-Attributes operation over a non-TLS  
157 connection, the Client MUST be prepared to receive an HTTP 426 response to upgrade  
158 the connection to TLS [RFC2817]. See [RFC8010] and [RFC8011] for authentication  
159 methods that require a secure channel.

160 A Printer MUST support all the same operation attributes for a Get-User-Printer-Attributes  
161 operation that it supports with a Get-Printer-Attributes operation, including those used by a  
162 Client to request a filtered response: “document-format” [RFC8011]; “first-index”  
163 [PWG5100.13]; “limit” [PWG5100.13]; and any of the attributes named by “printer-get-  
164 attributes-supported” [PWG5100.13].

165 ~~A Printer MUST support all the operation attributes it supports with a Get-User-Printer-~~  
166 ~~Attributes operation that it supports with Get-Printer-Attributes, including those used by a~~  
167 ~~Client to request a filtered response: “document-format” [RFC8011]; “first-index”~~  
168 ~~[PWG5100.13]; “limit” [PWG5100.13]; and any of the attributes named by “printer-get-~~  
169 ~~attributes-supported” [PWG5100.13].~~

## 170 Get-User-Printer-Attributes Request

171 The following groups of attributes are supplied as part of the Get-User-Printer-Attributes  
172 request:

### 173 Group 1: Operation Attributes

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

176 As described in [RFC8011] Section 4.1.4.1. The Client MUST supply and the  
177 Printer MUST support both of these attributes.

178 "printer-uri" (uri) :

179 The Client MUST supply and the Printer MUST support this attribute, which is  
180 the target for this operation as described in [RFC8011] Section 4.1.5.

181 "requesting-user-name" (name(MAX)) :

182 The Client MUST supply and the Printer MUST support this attribute, as  
183 described in [RFC8011] Section 9.3.

184 “requesting-user-uri” (uri) :

185 The Client SHOULD supply and the Printer MUST support this attribute, as  
186 described in [PWG5100.13] section 5.1.6.

187 “requesting-user-vcard” (1setOf text(MAX)) :

188 The Client SHOULD supply and the Printer MUST support this attribute, as  
189 described in [PWG5100.SYSTEM] section 7.1.6.

190 "requested-attributes" (1setOf keyword):

191 The "requested-attributes" (1setOf keyword) attribute MAY be supplied by the  
192 Client and MUST be supported by the Printer as described in [RFC8011]  
193 Section 4.2.5.1.

194 "document-format" (mimeMediaType):

195 The "document-format" (mimeMediaType) attribute SHOULD be supplied by  
196 the Client as described in [RFC8011] Section 4.2.5.1.

#### 197 **4.1.1.1 Get-User-Printer-Attributes Response**

198 The Printer returns the following sets of attributes as part of the Get-User-Printer-Attributes  
199 response:

200 Group 1: Operation Attributes

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

203 As described in [RFC8011] Section 4.1.4.1. The Client MUST supply and the  
204 Printer MUST support both of these attributes.

205 Status Message:

206 In addition to the REQUIRED status-code returned in every response, the  
207 response MAY include a "status-message" (text(255)) and/or a "detailed-  
208 status-message" (text(MAX)) operation attribute as described in [RFC8011]  
209 Appendix B and Section 4.1.6.

210 Group 2: Unsupported Attributes

211 See [RFC8011] Section 4.1.7 for details on returning unsupported attributes.

212 Group 3: Printer Attributes

213 This is the set of requested attributes and their current values. See [RFC8011]  
214 Section 4.2.5.2 for details.

## 215 **5 Conformance Requirements**

### 216 **5.1 Printer Conformance Requirements**

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

218 1. The Get-User-Printer-Attributes operation as defined in section 4.

### 219 **5.2 Client Conformance Requirements**

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

221 1. The Get-User-Printer-Attributes operation as defined in section 4.

## 222 **6 Internationalization Considerations**

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

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

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

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

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

## 242 **7 Security Considerations**

243 The security considerations for the Get-User-Printer-Attributes operation build upon those  
244 defined for IPP/1.1 [RFC8011] and IPP/2.0 [PWG5100.12] for the Validate-Job, Create-Job  
245 and Print-Job operations. Additionally, a Printer MUST NOT send a Get-User-Printer-  
246 Attributes response over a non-TLS connection for authentication methods that require a  
247 secure channel, as defined in [RFC8010] and [RFC8011].

### 248 **7.1 Human-readable Strings**

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

251       • Unicode Security Mechanisms [UTS39] – detecting and avoiding security attacks  
252 Implementations of this specification are advised to also review the following informational  
253 document on processing of human-readable Unicode text strings:

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

## 255    **8    References**

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328 Mike Sweet – Apple Inc.  
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## 330 **10 Change History**

### 331 | **10.1 November 3, 2017**

332 | Updated with changes reported during last call.

- 333 | • Broken link to section 4 in section 3.1
- 334 | • Changed wording to eliminate instances of passive voice

### 335 | **10.2 October 16, 2017**

336 Updated as per feedback from IPP WG review in conference call on 2017-10-12 in  
337 preparation for editorial review and last call.

- 338 • Renamed and adopted new acronym
- 339 • Refactored section 4 editorially
- 340 • Added mention of “first-index” and “limit” filtering attributes
- 341 • Added “Conformance Requirements” section
- 342 • Removed “Table Index” since there are no tables

### 343 **10.3 October 10, 2017**

344 Updated as per feedback from IPP WG reflector posting from Apple, including editorial  
345 changes to comply with the new IPP Registration template.

### 346 **10.4 August 17, 2017**

347 Updated as per feedback from August 2017 IPP WG vF2F meeting minutes:

- 348 • Removed section 4
- 349 • Rewrote portions of now section 4 “Get-User-Printer-Attributes” definition and  
350 restructured presentation of list of attributes in request and response sub-sections  
351 for Get-User-Printer-Attributes definition
- 352 • Relabeled document to be “IPP Registration” instead of “White Paper”



**353 10.5 August 1, 2017**

354 Updated as per feedback from July 20, 2017 IPP WG meeting minutes and feedback:

- 355 • Added sub-sections for the Get-User-Printer-Attributes request and response,  
356 leveraging text from RFC 8011 and 5100.SYSTEM
- 357 • Updated Internationalization section to use Unicode 10 and added a bunch of  
358 references.
- 359 • Updated references to add System, and full standard of IPP/2.0 (5100.12)
- 360 • Other editorial fixes

**361 10.6 May 24, 2017**

362 Updated as per feedback from May 2017 F2F review.

- 363 • Removed previous use cases 3.1.2-3.1.5; renamed 3.1.6 to be new 3.1.2, with  
364 updated sequence diagram that includes Validate-Job / Create-Job response.
- 365 • Removed section 6 – no new IPP attributes need to be defined as of this draft.

**366 10.7 April 18, 2017**

- 367 • Updated and clarified the description in section 4 “Technical Solutions/Approaches”  
368 to explain with more detail why it is not practical to use the venerable Get-Printer-  
369 Attributes operation for the task of conveying print policies.

**370 10.8 April 4, 2017**

- 371 • Updated with new and elaborated use cases and accompanying sequence  
372 diagrams to better articulate the breadth of the problem space.

**373 10.9 February 1, 2017**

- 374 • Editorial changes.

**375 10.10 January 30, 2017**

- 376 • Initial draft.