

1 **IEEE-ISTO**  
2 **Printer Working Group**  
3 **IPP Fax Project**  
4 **Standard for IPPFAX/1.0 Protocol**

5  
6 **Working Draft**  
7 **Maturity: Initial**  
8  
9



10  
11 **Version 1.0**  
12 **February 11, 2004**  
13  
14

15  
16 **Abstract:** This document specifies the IPPFAX/1.0 protocol. The IPPFAX requirements [ifx-req] are derived from the requirements for  
17 Internet Fax [RFC2542].  
18 In summary, IPPFAX is used to provide a synchronous, reliable exchange of image Documents between clients and servers. The  
19 primary use envisaged of this protocol is to provide a synchronous image transmission service for the Internet. Contrast this with the  
20 Internet FAX protocol specified in [RFC2305] and [RFC2532] that uses the SMTP mail protocol as a transport.  
21 The IPPFAX/1.0 protocol is a specialization of the IPP/1.1 [RFC2911], [RFC2910] protocol supporting a subset of the IPP operations  
22 with increased conformance requirements in some cases, some restrictions in other cases, and some additional REQUIRED  
23 attributes. The IPPFAX Protocol uses the 'ippfax' URL scheme (instead of the 'ipp' URL scheme) in all its operations. Most of the  
24 new attributes defined in this document MAY be supported by IPP Printers as OPTIONAL extensions to IPP as well  
25 An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least the PDF/is as specified in [PWG5102.3-2004] which  
26 is defined for the 'application/pdf' document format MIME type. A Print System MAY be configured to support both the IPPFAX and  
27 IPP protocols concurrently, but each protocol requires separate Printer objects with distinct URLs.  
28

29 This document is available electronically at: [wd-afx10-20040211.pdf](http://wd-afx10-20040211.pdf), .doc  
30 A version showing the changes from the previous version is available at: [wd-afx10-20040211-rev.pdf](http://wd-afx10-20040211-rev.pdf)  
31 The latest version of this specification is available at: [ftp://pwg.org/pub/pwg/QUALDOCS/wd-afx10-latest.pdf](http://ftp://pwg.org/pub/pwg/QUALDOCS/wd-afx10-latest.pdf), .doc

32 **Copyright (C) 2004, IEEE ISTO. All rights reserved.**

33 This document may be copied and furnished to others, and derivative works that comment on, or otherwise explain it  
34 or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without  
35 restriction of any kind, provided that the above copyright notice, this paragraph and the title of the Document as  
36 referenced below are included on all such copies and derivative works. However, this document itself may not be  
37 modified in any way, such as by removing the copyright notice or references to the IEEE-ISTO and the Printer  
38 Working Group, a program of the IEEE-ISTO.

39 Title: The IPPFAX/1.0 Protocol

40 The IEEE-ISTO and the Printer Working Group DISCLAIM ANY AND ALL WARRANTIES, WHETHER EXPRESS  
41 OR IMPLIED INCLUDING (WITHOUT LIMITATION) ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR  
42 FITNESS FOR A PARTICULAR PURPOSE.

43 The Printer Working Group, a program of the IEEE-ISTO, reserves the right to make changes to the document  
44 without further notice. The document may be updated, replaced or made obsolete by other documents at any time.

45 The IEEE-ISTO takes no position regarding the validity or scope of any intellectual property or other rights that might  
46 be claimed to pertain to the implementation or use of the technology described in this document or the extent to  
47 which any license under such rights might or might not be available; neither does it represent that it has made any  
48 effort to identify any such rights.

49 The IEEE-ISTO invites any interested party to bring to its attention any copyrights, patents, or patent applications, or  
50 other proprietary rights which may cover technology that may be required to implement the contents of this  
51 document. The IEEE-ISTO and its programs shall not be responsible for identifying patents for which a license may  
52 be required by a document and/or IEEE-ISTO Industry Group Standard or for conducting inquiries into the legal  
53 validity or scope of those patents that are brought to its attention. Inquiries may be submitted to the IEEE-ISTO by e-  
54 mail at:

55 [ieee-isto@ieee.org](mailto:ieee-isto@ieee.org).

56 The Printer Working Group acknowledges that the IEEE-ISTO (acting itself or through its designees) is, and shall at  
57 all times, be the sole entity that may authorize the use of certification marks, trademarks, or other special  
58 designations to indicate compliance with these materials.

59 Use of this document is wholly voluntary. The existence of this document does not imply that there are no other  
60 ways to produce, test, measure, purchase, market, or provide other goods and services related to its scope.

**61 About the IEEE-ISTO**

62 The IEEE-ISTO is a not-for-profit corporation offering industry groups an innovative and flexible operational forum  
63 and support services. The IEEE-ISTO provides a forum not only to develop standards, but also to facilitate activities  
64 that support the implementation and acceptance of standards in the marketplace. The organization is affiliated with  
65 the IEEE (<http://www.ieee.org/>) and the IEEE Standards Association (<http://standards.ieee.org/>).

66 For additional information regarding the IEEE-ISTO and its industry programs visit <http://www.ieee-isto.org>.

67

**68 About the IEEE-ISTO PWG**

69 The Printer Working Group (or PWG) is a Program of the IEEE Industry Standards and Technology Organization  
70 (ISTO) with member organizations including printer manufacturers, print server developers, operating system  
71 providers, network operating systems providers, network connectivity vendors, and print management application  
72 developers. The group is chartered to make printers and the applications and operating systems supporting them  
73 work together better. All references to the PWG in this document implicitly mean "The Printer Working Group, a  
74 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open  
75 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and  
76 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these  
77 standards.

78 In general, a PWG standard is a specification that is stable, well understood, and is technically competent, has  
79 multiple, independent and interoperable implementations with substantial operational experience, and enjoys  
80 significant public support.

81 For additional information regarding the Printer Working Group visit: <http://www.pwg.org>

**82 Contact information:**

83 IFX Web Page: <http://www.pwg.org/qualdocs>

84 IFX Mailing List: [ifx@pwg.org](mailto:ifx@pwg.org)

85 To subscribe to the ipp mailing list, send the following email:

86 1) send it to [majordomo@pwg.org](mailto:majordomo@pwg.org)

87 2) leave the subject line blank

88 3) put the following two lines in the message body:

89 subscribe ifx

90 end

91

92 Implementers of this specification are encouraged to join the IFX Mailing List in order to participate in any  
93 discussions of clarifications or review of registration proposals for additional names.

94

95

**Contents**

96	1 Introduction .....	7
97	1.1 Operations Supported .....	7
98	1.2 Typical exchange .....	8
99	2 Terminology .....	9
100	2.1 Conformance Terminology .....	9
101	2.2 Other Terminology .....	9
102	3 IPPFAX Model .....	11
103	3.1 Printer Object Relationships .....	11
104	3.2 A Printer object with multiple URLs .....	11
105	4 Common IPPFAX Operation Attribute Semantics .....	12
106	4.1 printer-uri (uri) operation attribute .....	12
107	4.2 version-number parameter .....	12
108	4.3 ippfax-version (type2 keyword) operation attribute .....	13
109	5 IPPFAX Printer Description Attributes .....	13
110	5.1 printer-uri-supported (1setOf uri) .....	14
111	5.2 ipp-versions-supported (1setOf type2 keyword) .....	14
112	5.3 ippfax-versions-supported (1setOf type2 keyword) .....	15
113	5.4 operations-supported (1setOf type2 enum) .....	15
114	5.5 document-format-supported (1setOf mimeType) .....	16
115	5.6 document-format-version-supported (1setOf text(127)) .....	16
116	5.7 digital-signatures-supported (1setOf type2 keyword) .....	16
117	5.8 pdl-override-supported (type2 keyword) .....	16
118	6 Identity exchange .....	16
119	6.1 sending-user-vcard (text(MAX)) operation/Job Description attribute .....	17
120	6.2 receiving-user-vcard (text(MAX)) operation/Job Description attribute .....	17
121	6.3 sender-uri (uri) operation/Job Description attribute .....	18
122	7 Submission using Print-Job .....	18
123	7.1 IPP/1.1 Print-Job operation attributes .....	18
124	7.1.1 ipp-attribute-fidelity operation attribute .....	19
125	7.1.2 document-format (mimeType) operation attribute .....	20
126	7.1.3 document-format-version (type2 keyword) operation attribute .....	20
127	7.2 Job Template Attributes (for Print-Job) .....	21
128	7.2.1 media (type2 keyword   name(MAX)) Job Template .....	22
129	7.3 Delivery Confirmation using the Print-job response .....	23

130	7.4 Originator identifier image .....	23
131	8 IPPFAX operations.....	24
132	8.1 Operation Conformance Requirements .....	24
133	8.2 Print-Job operation .....	25
134	8.3 Cancel-Job operation .....	25
135	8.4 Get-Job-Attributes and Get-Jobs operations .....	25
136	9 Security considerations.....	26
137	9.1 Data Integrity and authentication .....	26
138	9.2 Data Privacy (encryption) .....	27
139	9.3 uri-authentication-supported (1setOf type2 keyword) .....	28
140	9.4 uri-security-supported (1setOf type2 keyword) .....	29
141	9.5 Using IPPFAX with TLS.....	30
142	9.6 Access control .....	31
143	9.7 Reduced feature set.....	31
144	10 Attribute Syntaxes .....	32
145	11 Status codes .....	32
146	12 Conformance Requirements .....	32
147	13 IPPFAX URL Scheme.....	33
148	13.1 IPPFAX URL Scheme Applicability and Intended Usage.....	33
149	13.2 IPPFAX URL Scheme Associated IPPFAX Port.....	34
150	13.3 IPPFAX URL Scheme Associated MIME Type .....	34
151	13.4 IPPFAX URL Scheme Character Encoding.....	34
152	13.5 IPPFAX URL Scheme Syntax in ABNF.....	34
153	13.6 IPPFAX URL Examples.....	35
154	13.7 IPPFAX URL Comparisons .....	36
155	14 IANA Considerations .....	36
156	15 References .....	36
157	15.1 Normative .....	36
158	15.2 Informative .....	37
159	16 Authors' addresses.....	40
160	17 Appendix B: vCard Example.....	42

161	18 Revision History (to be removed when standard is approved) .....	42
-----	---	----

162

163

### Table of Tables

164	Table 1 - Printer Description attributes conformance requirements .....	14
165	Table 2 - Receiver Attributes that the Sender validates with Get-Printer-Attributes.....	16
166	Table 3 - Summary of Identify Exchange attributes .....	17
167	Table 4 - [RFC 2911] Print-Job operation attributes.....	19
168	Table 5 - IPPFAX Semantics for Job Template Attributes .....	22
169	Table 6 - Conformance for IPPFax/1.0 Operations.....	25
170	Table 8 - Authentication Requirements.....	28
171	Table 9 - Digest Authentication Conformance Requirements .....	29
172	Table 10 - Security (Integrity and Privacy) Requirements.....	29
173	Table 11 - Transport Layer Security (TLS) Conformance Requirements.....	30

174

## 175 **1 Introduction**

176 This document specifies the IPPFAX/1.0 protocol. The IPPFAX requirements [ifx-req] are derived from  
177 the requirements for Internet Fax [RFC2542].

178 In summary IPPFAX is used to provide a synchronous, reliable exchange of image documents between  
179 clients and servers. The primary use envisaged of this protocol is to provide a synchronous image  
180 transmission service for the Internet. Contrast this with the Internet FAX protocol specified in [RFC2305]  
181 and [RFC2532] that uses the SMTP mail protocol as a transport.

182 IPPFAX is primarily intended as a method of supporting a synchronous, secure, high quality document  
183 distribution protocol over the Internet. It therefore discusses paper, pages, scanning and printing, etc.  
184 There is, however, no requirement that the input documents come from actual paper nor is there a  
185 requirement that the output of the process be printed paper. The only conformance requirements are those  
186 associated with the exchange of data over the network.

187 The IPPFAX/1.0 protocol is a specialization of the IPP/1.1 [RFC2911], [RFC2910] protocol supporting a  
188 subset of the IPP operations with increased conformance requirements in some cases, some restrictions in  
189 other cases, and some additional REQUIRED attributes. The IPPFAX Protocol uses the 'ippfax' URL  
190 scheme (instead of the 'ipp' URL scheme) for all operations.

191 An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least PDF/is [PWG5102.3-  
192 2004] which is defined for the 'application/pdf' document format MIME type. A Print System MAY be  
193 configured to support both the IPPFAX and IPP protocols concurrently for a single output device (or  
194 multiple output devices), but each protocol requires separate Printer objects with distinct URLs. Note - It  
195 is assumed that the reader is familiar with IPP/1.1 [RFC2911], [RFC2910], [RFC3196], and [ipp-iig-bis].

196 An IPPFAX client is called a Sender. The user of the Sender is called the Sending User. The Sending  
197 User either (1a) loads the Document into the Sender or (1b) causes the Sender to generate the  
198 Document data by means outside the scope of this standard, (2) indicates the Receiver's network  
199 location, and (3) starts the exchange.

200 The target market for an IPPFAX receiver is a midrange imaging device that can support the minimum  
201 memory requirements that are required by the data format PDF/is, but the image format is structured in  
202 such a way that the Receiver is not required to include a disk or other permanent storage.

### 203 **1.1 Operations Supported**

204 All IPPFax Senders and Receivers MUST support the following operations:

205

- 206 1. Get-Printer-Attributes - If the document-format-version is not PDF/is or the media is not  
207 iso\_a4\_210x297mm or na\_letter\_8.5x11in, then the Sender MUST verify that the Receiver can  
208 support the alternate attributes. Rational: Using Get-Printer-Attributes would avoid rejection of  
209 the job which is important if the document data is very large.
- 210 2. Print-Job - Sender MUST submit the IPPFAX job with a single document (Create-Job, Send-  
211 document and Send-URI and Print-URI MUST NOT be supported by Senders or Receivers).
- 212 3. Get-Job-Attributes - The Sender MUST support and MUST use this operation to check for  
213 successful job completion unless the Sending User wishes otherwise. Job-History MUST be  
214 retained by the Receiver for at least 5 minutes after job completion. See 4.3.7.2 of RFC2911 for  
215 printer object Job-History discussion.
- 216 4. Job-Cancel – Receivers MUST support this operation but only for authenticated Administrators  
217 or Operators.
- 218 All IPPFax Senders and Receivers MUST NOT support any other IPP operations including job  
219 operations and administrative operation.

## 220 1.2 Typical exchange

221 This section lists a typical exchange of information between a Sender and a Receiver using the four  
222 operations listed in section 1.1.

- 223 1. The Sending User determines the network location of the Receiver (value of the “printer-uri”  
224 operation attribute) – see section 4.1. This document does not specify how the Sending User does  
225 this. Possible methods include directory lookup, search engines, business cards, network discovery  
226 protocols such as SLP, etc. See Appendix E Generic Directory Schema of IPP/1.1 [RFC 2911].
- 227 2. The Sending User either (1) loads the Document into the Sender or (2) causes the Sender to  
228 generate the Document data by means outside the scope of this document, indicates the Receiver’s  
229 network location and starts the exchange.
- 230 3. The Sender MAY determine other PDF versions supported by the Receiver and the Sender MAY  
231 discover “media-supported” and “media-ready”.
- 232 4. The Sender converts the document, if necessary, into PDF/is or another PDF subset depending on  
233 the Receiver’s capabilities. The PDF/is data format is described in detail in the “PDF Image-  
234 Streamable (PDF/is)” specification [PWG5102.3-2004].



- 235 5. The Sender submits the document in a Print-Job request to the Receiver. The Sender SHOULD  
236 include the sending user vCard[RFC2426, RFC2425] and receiving user vCard in the Print-Job  
237 operations.
- 238 6. The Receiver returns a Print-Job response to the Sender. The Sender in turn MUST inform the  
239 Sending-User.
- 240 7. The Sender MUST use Get-Job-Attributes to check for successful job completion unless the  
241 Sending User requests otherwise.

## 242 2 Terminology

243 This section defines the following additional terms that are used throughout this standard.

### 244 2.1 Conformance Terminology

245 Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**,  
246 **NEED NOT**, and **OPTIONAL**, have special meaning relating to conformance to this specification. These  
247 terms are defined in [RFC2911] section 13.1 on conformance terminology, most of which is taken from  
248 RFC 2119 [RFC2119]. In order to help the reader compare and contrast the IPP and IPPFAX protocols,  
249 this document uses lower case “must”, “may” etc., to reproduce IPP Protocol conformance requirements  
250 for IPP clients and IPP Printer objects as stated in other documents. If such reproduction in this document  
251 contradicts an IPP document, it is a mistake, and that IPP document prevails.

### 252 2.2 Other Terminology

253 This standard defines a logical model of an IPPFAX interchange. The following terms are introduced and  
254 capitalized in order to indicate their specific meaning:

255 **IPP Protocol** The protocol defined in [RFC2911] and [RFC2910] and any IPP Protocol Extension  
256 document (see section 15). For the IPP/1.1 Protocol each operation request must use the ‘ipp’ URL  
257 scheme.

258 **IPPFAX Protocol** The protocol defined in this or a future revision document and any future extension  
259 document. For the IPPFAX Protocol each operation request MUST use the ‘ippfax’ URL scheme (see  
260 section 4.1 and 13). Unless a specific version number is appended to “IPPFAX”, such as “IPPFAX/1.0”,  
261 the term IPPFAX applies to all versions.

262 **Printer object (or Printer)** A hardware or software entity that accepts protocol operation requests and  
263 returns protocol responses. A Printer object MAY be: (1) an IPP Printer object or (2) an IPPFAX Printer

264 object, DEPENDING ON IMPLEMENTATION (see section **Error! Reference source not found.**), but  
265 MUST NOT be both (since they support some different operations and attributes and are really two  
266 different kinds of Print Services). A Printer object MAY support multiple URLs with different security,  
267 authentication, and/or access control (see [RFC2911] sections 4.4.1, 4.4.2, 4.4.3, and 8). However, each  
268 URL for a Printer object MUST support the same operations and attributes with the same values, except as  
269 restricted depending on the security, authentication, and/or access control implied by the URL. In other  
270 words, each URL for a given Printer object is offering the same Print Service.

271 Note: For brevity, this document uses the term “Receiver” instead of “IPPFAX Printer object”.  
272 This document uses the term “Printer object” (and “Printer”) when the statement is intended to  
273 apply to a Printer object that MAY support the IPP Protocol or the IPPFAX protocol (but not both).

274 **Print Service** The print functionality offered by a Printer object. Several different Printer objects MAY  
275 offer the same Print Service. A Print Service MUST support only one printer object.

276 **IPP Printer object** A Printer object that supports the IPP Protocol and offers the IPP Print Service (by  
277 definition).

278 **Receiver** The Printer object that accepts IPPFAX protocol operations and receives the Document sent by  
279 the Sender. A Receiver offers the IPPFAX Print Service (by definition).

280 **Print System** All of the Printer objects on a single managed host network node. A Print System MAY  
281 support IPP and IPPFAX protocols concurrently (see section **Error! Reference source not found.**) for a  
282 single output device (or multiple output devices), but each protocol requires separate Printer objects with  
283 distinct URLs.

284 **client** A hardware and/or software entity that initiates protocol operation requests and accepts responses.  
285 A client MAY be: (1) an IPP client, (2) an IPPFAX client, or (3) both. However, this document uses the  
286 term “Sender”, instead of “IPPFAX client”. This document uses the term “client” when the statement is  
287 intended to apply to a client that MAY support the IPP Protocol, the IPPFAX protocol, or both protocols.

288 **IPP client** A client that uses the IPP Protocol to interact with an IPP Printer object.

289 **Sender** A client that uses the IPPFAX Protocol to query a Receiver and transmit a Document to that  
290 Receiver.

291 **Document** The electronic representation of a set of one or more pages that the Sender sends to the  
292 Receiver.

293 **Sending User** The person interacting with the Sender.

294 **Receiving User** The intended human recipient of the Document being sent by the Sender to the Receiver.

- 295 **IPP Job** A job submitted by an IPP client to an IPP Printer object using the IPP Protocol.
- 296 **IPPFAX Job** A job submitted by a Sender to a Receiver using the IPPFAX Protocol.
- 297 **PDF/Is** The file format defined by [PWG5102.3-2004].
- 298 The terminology defined in [RFC2911], such as **attribute, operation, request, response, operation**  
299 **attribute, Printer Description attribute, Job Description attribute, integrity, and privacy** is also used  
300 in this document with the same capitalization conventions and semantics.

### 301 **3 IPPFAX Model**

302 This sub-section defines the IPPFAX Model and its relationship to the IPP Protocol and Model.

#### 303 **3.1 Printer Object Relationships**

304 A Print System MAY support one or more Printer objects on a single network host. RFC 2911 [RFC2911]  
305 defines the relationship between Printer objects and output devices to be many to many (see [RFC2911]  
306 section 2.1). So one Printer object can represent one or more output devices and an output device can be  
307 represented by one or more Printer objects. The same relationships hold for the IPPFAX Protocol so that  
308 the relationship between Receivers and output devices is many to many.

#### 309 **3.2 A Printer object with multiple URLs**

310 For a Printer object that has multiple URLs, the multiple URLs MUST only be aliases for the Printer  
311 object, not connections to different Print Services. In other words, the semantics of operations and  
312 attributes accessed by the different URLs for a given Printer object MUST differ only in the security,  
313 authentication, and/or access control depending on the URL used.

314 The three parallel “printer-uri-supported” (1setOf uri), “uri-authentication-supported” (1setOf type2  
315 keyword), and “uri-security-supported” (1setOf type2 keyword) Printer Description attributes (see  
316 [RFC2911] sections 4.4.1, 4.4.2, and 4.4.3, respectively) MUST contain the URLs, authentication, and  
317 security, respectively, supported by the Printer object.

318

## 319 **4 Common IPPFAX Operation Attribute Semantics**

320 This section describes the IPPFAX/1.0 operation attribute semantics that are common to all operations.  
321 IPPFAX/1.0 does not define any new operations. Instead, IPPFAX/1.0 semantics are provided using  
322 existing IPP operations in [RFC2911], with increased conformance requirements as specified in this  
323 document.

### 324 **4.1 printer-uri (uri) operation attribute**

325 This operation attribute specifies the transfer path to the Receiver for the operation. As in IPP/1.1, the  
326 client MUST supply the “printer-uri” operation attribute in every IPPFAX request (see [RFC2911] section  
327 3.1.5). For IPPFAX, the attribute value MUST be a URL using the ‘ippfax’ scheme (see section 13)  
328 specifying the Receiver’s network location.

329 The following is an example value of the target “printer-uri” operation attribute and “printer-uri-supported”  
330 Printer Description attribute:

331       ippfax://www.acme.com/ippfax-printers/printer5

332 As in IPP/1.1 [RFC2911] for each operation, the Receiver NEED NOT validate that the “printer-uri”  
333 operation attribute is present and that the value supplied by the Sender matches one of the Receiver’s  
334 “printer-uri-supported” Printer Description attribute (see section 5.1). For URI matching rules see section  
335 13.7. If the Receiver does validate the “printer-uri” operation attribute and the URI value supplied does not  
336 match any value of the Receiver’s “printer-uri-supported” Printer Description attribute, the Receiver  
337 MUST reject the request, return the ‘client-error-attributes-or-values-not-supported’ status code, and return  
338 the attribute and value in the Unsupported Attributes Group.

### 339 **4.2 version-number parameter**

340 This IPP/1.1 operation parameter ([RFC2911] section 3.1.8) specifies the major and minor version number  
341 of the IPP Protocol being used *as part of the IPPFAX Protocol*. As in IPP/1.1, the Sender MUST supply  
342 this parameter in every request and the Receiver MUST return this parameter in every response.

343 For IPPFAX version 1.0 as specified in this document, the Sender MUST supply the IPP version number  
344 parameter with a value of ‘1.1’ or a higher minor version number.

345

### 346 **4.3 ippfax-version (type2 keyword) operation attribute**

347 The value of this operation attribute indicates the version of the IPPFAX Protocol and encoding that the  
348 Sender is requesting and the Receiver is returning. The Sender MUST supply this operation attribute in  
349 every request and the Receiver MUST return this operation attribute in every response. This operation  
350 attribute MUST be placed in the Operation Attributes Group *immediately* after the operation attributes  
351 whose order is specified in IPP/1.1 [RFC2911]. The semantics of the “ippfax-version” operation attribute  
352 are the same for the IPPFAX Protocol as the “version-number” parameter for IPP 1.1(see [RFC2911]  
353 section 3.1.8).

354 For IPPFAX version 1.0 as specified in this document, the Sender MUST supply the IPPFax version  
355 operation attribute with the keyword value of ‘1.0’.

356 The Receiver MUST list the IPPFAX versions supported in the “ippfax-versions-supported” (1setOf type2  
357 keyword) Printer Description attribute (see section 5.3).

358 The Sender MUST send and the Receiver MUST check both the IPP (see section 4.2) and IPPFAX version  
359 numbers supplied by the Sender in each request, not just the IPPFAX version number.

## 360 **5 IPPFAX Printer Description Attributes**

361 This section defines the IPPFAX Printer Description attributes and the IPP Printer Description attributes  
362 whose semantics are augmented for IPPFAX.

363 Table 1 lists all the IPPFAX conformance requirements for IPP and IPPFAX Printer Description attributes  
364 whose semantics are defined in this document.

365 All Printer Description attributes not listed in Table 1 have the same conformance requirements as defined  
366 in IPP/1.1 [RFC2911] or other IETF or PWG standards track IPP documents.

367 See section 7.2 for the Receiver conformance requirements for the “xxx-supported”, “xxx-default”, and  
368 “xxx-ready” Job Template Printer attributes.

369

**Table 1 - Printer Description attributes conformance requirements**

Attribute Name (attribute syntax)	IPP Fax Receiver support	Section
printer-uri-supported (1setOf uri) *	MUST	5.1
ipp-versions-supported (1setOf type2 keyword) *	MUST	5.2
ippfax-versions-supported (1setOf type2 keyword)	MUST	5.3
operations-supported (1setOf type2 enum) *	MUST	5.4
document-format-supported (1setOf mimeType) *	MUST	5.5
document-format-version-supported (1setOf text(127)) **	MUST	5.6
digital-signature-supported (1setOf type2 keyword) **	MUST	5.7
pdl-override-supported (type2 keyword) *	MUST	5.8

370 \* These IPP/1.1 attributes are defined in [RFC2911], but have enhanced semantics defined in this  
371 document.

372 \*\* These IPP attributes are defined in [PWG 5100.7], but have enhanced or constrained semantics defined  
373 in this document.

#### 374 **5.1 printer-uri-supported (1setOf uri)**

375 This attribute (see [RFC2911] section 4.4.1) contains the set of target URIs that the Receiver supports, i.e.,  
376 the URI values that a client can supply as values of the “printer-uri” target operation attribute in requests.  
377 A Receiver MUST support this Printer Description attribute. This attribute MUST only contain URIs  
378 using the ‘ippfax’ scheme.

#### 379 **5.2 ipp-versions-supported (1setOf type2 keyword)**

380 This attribute (see [RFC2911] section 4.4.1.4) identifies the version or versions of the IPP encoding that  
381 this Receiver supports as part of the IPPFAX Protocol (rather than indicating that the Receiver supports the  
382 IPP Protocol), including major and minor versions, i.e., the version numbers for which this Receiver meets  
383 the conformance requirements. The Receiver MUST support this Printer Description attribute. The  
384 Receiver MUST compare the “version-number” parameter (see section 4.2), with the values of this  
385 attribute in order to determine whether the Printer supports the IPP version requested by the Sender *as part*  
386 *of the IPPFAX Protocol*.

387 Standard keyword values are (from [RFC2911]):

388 ‘1.1’: The IPPFAX operations meets encoding conformance requirements of IPP version 1/1 as specified  
389 in [RFC2911] and [RFC2910].

390

**391 5.3 ippfax-versions-supported (1setOf type2 keyword)**

392 This attribute identifies the version or versions of the IPPFAX Protocol that this Receiver supports,  
393 including major and minor versions, i.e., the version numbers for which this Receiver meets the  
394 conformance requirements. The support of this attribute indicates that this Printer object is a Receiver as  
395 opposed to a regular IPP Printer object

396 The Receiver MUST compare the “ippfax-version” operation attribute (see section 4.3) supplied by the  
397 Sender in each request, with the values of this attribute in order to determine whether the Receiver supports  
398 the IPPFAX version requested by the Sender.

399 Standard keyword values are:

400 ‘1.0’: Meets the conformance requirements of IPPFAX 1/0 as specified in this document.

401

**402 5.4 operations-supported (1setOf type2 enum)**

403 This attribute (see [RFC 2911] section 4.4.15) identifies the set of supported operations for this Receiver  
404 and contained Job objects. A Receiver MUST support this Printer Description attribute.

405 The values of this attribute MAY depend on the URL supplied in the “printer-uri” operation attribute  
406 and/or MAY depend on the authority of the authenticated requesting user. For example, a Receiver that  
407 supports administrative operations MUST NOT support administrative operations for use by end users, but  
408 such a Receiver MAY return the administrative operation enums to end users. See section 9 for  
409 conformance requirements for these operations.

410 A receiver MUST only support the following operations:

411 • get-printer-attributes

412 • print-job

413 • cancel-job

414 • get-jobs

415 • get-job-attributes

416 A receiver MUST NOT support any other operation.

417 **5.5 document-format-supported (1setOf mimeType)**

418 This attribute (see [RFC 2911] section 4.4.22) identifies which document formats the Receiver supports.  
419 The Receiver MUST support this Printer Description attribute. Both the Sender and Receiver MUST only  
420 support 'application/pdf'.

**Deleted:** As in IPP/1.1, t  
**Deleted:** (see [RFC2911] section 4.4.22).¶  
Since most document formats don't give the "blind interchange" guarantee of document presentation fidelity for all implementations and configurations, the IPPFAX document formats supported MUST be a subset of the IPP document formats supported.¶  
Both the Sender and Receiver MUST only support application/pdf.

421 **5.6 document-format-version-supported (1setOf text(127))**

422 This attribute (see [PWG 5100.7] section 7.8) identifies which PDF subsets the Receiver supports. A  
423 Receiver MUST support this attribute and a Sender MAY support this attribute. Both the Sender and  
424 Receiver MUST support the 'PDF/is-1.0' subset of PDF. The Receiver MAY support other subsets of PDF  
425 and if it does then the Receiver MUST only list subsets that it fully supports.

**Deleted:** CHANGE: Reference the "Job X extensions" Specification.¶  
**Deleted:** formats  
**Deleted:** ,  
**Deleted:** ¶  
**Deleted:** "  
**Deleted:** "  
**Deleted:** versions  
**Deleted:** formats

426 **5.7 digital-signatures-supported (1setOf type2 keyword)**

427 This attribute (see [PWG 5100.7] section 7.4) identifies which digital signature technologies are supported  
428 by the Receiver. A Receiver MUST support this Printer Description attribute.

429 If the Receiver cannot validate the digital signature or if the digital signature fails to verify, then the  
430 Receiver MUST notify the Receiving User using an implementation specific method.

**Deleted:** Digital-signature and digital-signature-supported will move to [jobX] specification. Reference them from that specification.¶

431 **5.8 pdl-override-supported (type2 keyword)**

432 This attribute (see [RFC 2911] section 4.4.28) identifies Receiver implementation support for overriding  
433 document data instructions with IPPFax job attributes. A Receiver MUST support this printer subscription  
434 attribute with the value 'attempted'. A Receiver MUST attempt to override at least the media attribute.  
435  
436

**Deleted:** expresses the ability for a particular Receiver implementation to either attempt to override document data instructions with IPPFAX attributes or not.¶  
¶ This attribute MUST have the value 'attempted'

437 **6 Identity exchange**

438 Need to move these attributes and the contents of section 7 in with the other operation attributes (section 8).

439 This section defines the attributes that the Sender and the Receiver can use to identify each to the other and  
440 to identify the Sending User and the Receiver User. Table 2 lists these attributes and shows the Sender and  
441 Receiver conformance requirements.

**Deleted:** or a higher quality IANA-registered value (such as a hypothetical 'guaranteed' value), and  
**Deleted:** the  
**Deleted:** ¶  
**Deleted:** ¶  
NOTE: RFC2911 only requires that the attribute be supported but the supported may be not-attempted.¶  
**<#>Sender Validation of the Receiver's Capabilities¶**  
This section describes how a Sender MUST first validate the target Priu... [1]  
**Formatted:** Bullets and Numbering  
**Deleted:** ¶  
**Deleted:** and remove section 8



Table 2 - Summary of Identify Exchange attributes

Attribute	Sender supplies *	Receiver supports
sending-user-vcard (text(MAX))	MAY	MUST
receiving-user-vcard (text(MAX))	SHOULD	MUST
sender-uri (uri)	MUST	MUST

\* Sender supplies in a Print-Job,operation.

Formatted: Bullets and Numbering

### 6.1 sending-user-vcard (text(MAX)) operation/Job Description attribute

This operation attribute identifies the Sending User in MIME vCard v3.0 [RFC2426, RFC2425] format. The Sender MAY send this operation attribute in an IPPFAX Print-Job operation. The Receiver MUST support this Print-Job operation attribute according to the vCard v3.0 specification and MUST populate the job's corresponding Job Description attribute. The Receiver MUST support MAX (1023) octets of text. However, the Receiver MAY ignore any image, logo, and sound parts, in which case it MUST still accept the Print-Job request and return the 'successful-ok-ignored-or-substituted-attributes' status code (see [RFC2911] section 13.1.2.2), but NEED NOT return the attribute and its ignored values in the Unsupported Attributes Group.

For a sample vCard see section 1. If the Sender supplies the attribute, then the Receiver MUST use its value to populate the Job object's corresponding Job Description attribute of the same name.

The Receiver MAY choose to use this information on a job start and end sheet (banner page) for the job. As in IPP/1.1, whether or not the Receiver prints a separate job start sheet depends on the "job-sheets" Job Template attribute, if supported. The Sender can request the Receiver to print a separate start sheet if the Receiver's "job-sheets-supported" Printer attribute (see [RFC2911] section 4.2.3) contains a value other than 'none'. The Sender can suppress the Receiver's separate start sheet if the Receiver's "job-sheets-supported" Printer attribute contains the 'none' value. If the Sender omits the "job-sheets" Job Template attribute, the Receiver's "job-sheets-default" value will be used.

Formatted: Bullets and Numbering

### 6.2 receiving-user-vcard (text(MAX)) operation/Job Description attribute

This operation attribute identifies the intended Receiving User in MIME vCard format [RFC2426, RFC2425]. The Sender SHOULD send this operation attribute in an IPPFAX Print-Job operation. The Receiver MUST support this Print-Job operation attribute and MUST populate the job's corresponding Job Description attribute. The Receiver MUST support MAX (1023) octets of text. However, the Receiver MAY ignore any image, logo, and sound parts, in which case it MUST still accept the Print-Job request and return the 'successful-ok-ignored-or-substituted-attributes' status code (see [RFC2911] section 13.1.2.2), but NEED NOT return the attribute and its ignored values in the Unsupported Attributes Group.

470 For a sample vCard see section 1. If the Sender supplies the attribute, then the Receiver MUST use its  
471 value to populate the Job object's corresponding Job Description attribute of the same name.

472 The Receiver MAY choose to use this information on a job start and end sheet (banner page) for the job.  
473 See discussion under section 6.1.

Formatted: Bullets and Numbering

### 474 **6.3 sender-uri (uri) operation/Job Description attribute**

475 This operation attribute identifies the Sender in a similar manner to the way a Sending Station ID is used in  
476 a GSTN fax device. The value of this identity is not specified in this document but MUST uniquely  
477 identify the Sender device and be traceable to the Sender. The manufacturer of the Sender MUST ensure  
478 that the customer configures the Sender with a value for this attribute that is a syntactically valid URI  
479 before first attempt to send an IPPFAX Job.

480 The Sender MUST send this operation attribute with the configured value in an IPPFAX Print-Job  
481 operation. The Receiver MUST support this Print-Job operation attribute and MUST populate the job's  
482 corresponding Job Description attribute.

483 The Receiver MUST use its value to populate the Job object's corresponding Job Description attribute of  
484 the same name. This value is only a comment (since it can be spoofed) and is used for logging purposes  
485 and has nothing to do with authentication (for which, see section 9). This attribute is more akin to an email  
486 'Reply-To' field.

Formatted: Bullets and Numbering

## 487 **7 Submission using Print-Job**

488 The Sender and Receiver MUST support creating IPPFAX Jobs using the Print-Job. The Sender and  
489 Receiver MUST NOT support print by reference, i.e., MUST NOT support the Print-URI and Send-URI  
490 operations, since they do not provide the same security and assurance of accessibility as pushing the  
491 document data does.

Formatted: Bullets and Numbering

### 492 **7.1 IPP/1.1 Print-Job operation attributes**

493 Table 3 lists the operation attributes for Print-Job operations for Senders, IPP/1.1 Printers, and Receivers.  
494 Differences in Sender conformance from IPP/1.1 clients are indicated with footnotes. Any other IPP  
495 operation attributes defined in other documents are OPTIONAL for IPPFAX.

496

**Table 3 - [RFC 2911] Print-Job operation attributes**

Operation attribute	Section	Sender supplies	Receiver supports
attributes-charset (charset)		MUST	MUST
attributes-natural-language (naturalLanguage)		MUST	MUST
printer-uri (uri) *	4.1	MUST	MUST
requesting-user-name (name(MAX)) *		SHOULD	MUST
job-name (name(MAX))		MAY	MUST
ipp-attribute-fidelity (boolean) *	7.1.1	MUST with 'true' value <sup>1</sup>	MUST
document-name (name(MAX)) *		MAY	MUST
compression (type3 keyword) *		MAY	MUST
document-format (mimeMediaType) *	7.1.2	MUST <sup>2</sup>	MUST
document-format-version (type2 keyword)	7.1.3	MUST <sup>3</sup>	MUST
document-natural-language (naturalLanguage) *		MAY	MAY
job-k-octets (integer(0:MAX))		MAY	MAY
job-impressions (integer(0:MAX))		MAY	MAY
job-media-sheets (integer(0:MAX))		MAY	MAY
sending-user-vcard (1setOf text(MAX))	6.1	MAY <sup>3</sup>	MUST
receiving-user-vcard (text(MAX))	6.2	SHOULD <sup>3</sup>	MUST
sender-uri (name(MAX))	6.3	MUST <sup>3</sup>	MUST

497 \* As in IPP/1.1, these attributes are NOT Job Description attributes, only Operation attributes.  
 498

Formatted: Bullets and Numbering

### 499 **7.1.1 ipp-attribute-fidelity operation attribute**

500 This operation attribute (see [RFC2911] section 3.2.1.1) indicates whether or not the client requires the  
 501 Printer to support all Job Template attributes and values supplied. The Sender MUST supply this operation  
 502 attribute in the Print-Job operations and the value MUST be 'true'. A Receiver MUST validate and support  
 503 this operation attribute. Note: [RFC2911] does not REQUIRE the IPP Client to supply this operation  
 504 attribute and allows the client to supply the 'false' value.

<sup>1</sup> [RFC2911] does not require the client to supply the "ipp-attribute-fidelity" and allows the client to supply either the 'true' or 'false' value.

<sup>2</sup> The [RFC2911] does not require the IPP client to supply the "document-format" operation attribute.

<sup>3</sup> These attributes were not defined in [RFC2911].

505 If the Sender does not supply this attribute or supplies the ‘false’ value, the Receiver MUST reject the  
 506 operation, MUST return the ‘client-error-bad-request’ status code, and SHOULD return the ‘ipp-attribute-  
 507 fidelity’ attribute name keyword in the Unsupported Attributes Group (see section **Error! Reference  
 508 source not found.**).

Formatted: Bullets and Numbering

### 509 **7.1.2 document-format (mimeMediaType) operation attribute**

510 This operation attribute (see [RFC2911] section 3.2.1.1) identifies the MIME Media Type of the document  
 511 that the Sender is sending. The Sender MUST supply this operation attribute in the Print-Job operation and  
 512 the value MUST be “application/PDF”. A Receiver MUST validate that the value of attribute is  
 513 “application/pdf”. Note: [RFC2911] does not REQUIRE the IPP Client to supply this operation attribute.

514 If the Sender does not supply this attribute, the Receiver MUST reject the operation, MUST return the  
 515 ‘client-error-bad-request’ status code, and SHOULD return the ‘document-format’ attribute name keyword  
 516 in the Unsupported Attributes Group (see section **Error! Reference source not found.**).

517 Because only one document-format MAY be supported, attribute coloring is not relevant for IPPFax. If the  
 518 Sender desires to send a different format, then it should use a different transmission protocol than IPPFax.

Formatted: Bullets and Numbering

### 519 **7.1.3 document-format-version (type2 keyword) operation attribute**

520 This attribute (see [RFC2911] section 3.2.1.1) should be taken from the JobX specification. **Revise this  
 521 section. Reference the JobX spec.**

522 **(Add somewhere a mention that Sender must support generating and transmitting PDF/is-1.0. Maybe in  
 523 section 1 to make it clear that it is a basic part of IPPFAX?)**

524 This operation attribute identifies the type2 keyword of the pdf document that the Sender is sending. The  
 525 Sender MUST supply this operation attribute in the Print-Job operation. A Receiver MUST validate and  
 526 support this operation attribute.

527 If the Sender supplies a value that the Receiver does not support, i.e., not a value of the Receiver’s  
 528 “document-format-versions-supported” Printer Description attribute, the Receiver MUST reject the  
 529 operation and return the ‘client-error-document-format-not-supported’ status code.

530 Standard keyword values are defined in section 5.6.

## 531 **7.2 Job Template Attributes (for Print-Job)**

532 Table 4 lists all of the Job Template attributes that have enhanced or constrained semantics for IPP Fax.  
533 IPP Fax Senders SHOULD NOT supply Job Template attributes except Media[RFC2911].

534 As in [RFC2911], the term “Job Template attribute” is actually up to four attributes: the “xxx” Job  
535 attribute, and the “xxx-default”, “xxx-supported”, and possibly the “xxx-ready” Printer attributes. Any  
536 other IPP Job Template attributes defined in other documents are OPTIONAL for IPPFAX.

537 As in IPP/1.1, if a Receiver supports the “xxx” Job Template attribute, then it MUST support the  
538 corresponding “xxx-default” (if defined) and “xxx-supported” Printer attributes as well, and MAY support  
539 the “xxx-ready” attribute (if defined).

540 In Table 4, if the “Sender supply” and “Receiver support” columns contain an explicit single value, the  
541 Sender MAY send and the Receiver MAY support the Job Template attribute for an IPPFAX Job. When  
542 supported, the Sender MUST send and the Receiver MUST support only the indicated value; that is, there  
543 is only one allowed value. Each such single value has been selected as the value for the attribute that would  
544 correspond to the *expected behavior* if the attribute were not supported at all. If these attributes are  
545 supplied in an IPPFAX Job with any other value, the Receiver MUST reject the Print-Job operation (since  
546 the value isn’t supported and “ipp-attribute-fidelity” MUST be ‘true’).

547 If the Receiver supports this attribute, the Receiver MUST return only the indicated value in the Get-  
548 Printer-Attributes response for the corresponding “xxx-supported” and “xxx-default” Printer attributes.  
549 Note: These are attributes which might degrade the appearance of the document or provide a significantly  
550 non-FAX feature if the non-default value were supplied and supported, such as “number-up” = 2 or “job-  
551 priority” = 100, respectively.

552 In Table 4, if the “Sender supply” and “Receiver support” columns contain “MUST NOT”, the Sender  
553 MUST NOT supply and the Receiver MUST NOT support the Job Template attribute for an IPPFAX Job.  
554 If these attributes are supplied in an IPPFAX Job, the Receiver MUST reject the Print-Job operation (since  
555 the attribute isn’t supported and “ipp-attribute-fidelity” MUST be ‘true’). When querying the Receiver  
556 with the Get-Printer-Attributes operation, the corresponding “xxx-default” and “xxx-supported” MUST  
557 NOT be returned. Note: These are attributes which might degrade the appearance of the document or  
558 provide a significantly non-FAX feature and do not have an obvious value which corresponds to the  
559 behavior when the attribute is not supported at all, such as media-input-tray-check (type3 keyword |  
560 name(MAX)) or output-bin (type2 keyword | name(MAX)).

561

562

563

Table 4 - IPPFAX Semantics for Job Template Attributes

Job Template attribute	Sender supply /Receiver support	IPP Fax behavior	Reference
copies (integer(1:MAX))	MUST NOT	1 copy	[RFC2911]
finishings (1setOf type2 enum)	MUST NOT	Administrator's choice	[RFC2911]
job-hold-until (type3 keyword   name(MAX))	MUST NOT	'no-hold'	[RFC2911]
job-priority (integer(1:100))	MUST NOT	50	[RFC2911]
job-sheets (type3 keyword   name(MAX))	MUST NOT	Administrator's choice	[RFC2911]
media (type3 keyword   name(MAX))	MUST (see section 7.2.1)		[RFC2911]
multiple-document-handling (type2 keyword)	MUST NOT	No multiple document jobs	[RFC2911]
number-up (integer(1:MAX))	MUST NOT	1	[RFC2911]
orientation-requested (type2 enum)	MUST NOT		[RFC2911]
page-ranges (1setOf rangeOfInteger(1:MAX))	MUST NOT	1:MAX	[RFC2911]
print-quality (type2 enum)	MUST NOT	Administrator's choice	[RFC2911]
printer-resolution (resolution)	MUST NOT (see section <b>Error! Reference source not found.</b> )		[RFC2911]
sides (type2 keyword)	MUST NOT	Administrator's choice	[RFC2911]

Formatted: Bullets and Numbering

564

**7.2.1 media (type2 keyword | name(MAX)) Job Template**

565

566

567

568

This Job Template attribute (see [RFC2911] section 4.2.11) identifies the medium to be used for all sheets of the job. The Sender MUST supply and the Receiver MUST support the “media” Job Template attribute in the Print-Job requests. The Receiver MUST support the “media-default”, and “media-supported” Printer attributes and SHOULD support the “media-ready” Printer attribute.

569

570

The keyword values MUST be Media Size Self Describing names defined in the PWG Standardized Name standard [pwg-media].

571 At a minimum, an IPPFAX receiver MUST be able to render the sizes ‘na\_letter\_8.5x11in’  
 572 ‘iso\_a4\_210x297mm’ and be able to print on at least one of those two sizes. The Receiver MAY  
 573 scale down at most 10% (PDF/is directives may prohibit this scaling), overflow to another page, or  
 574 truncate. If the Receiver does truncate then it MUST notify the Receiving User. Any scaling  
 575 performed MUST be isomorphic.  
 576 PDF Crop boxes SHOULD be used when the Sender knows that the imageable region is less than the  
 577 media size. If the crop box is the union of the lesser size of iso\_a4\_210x297mm and na\_letter\_8.5x11in  
 578 minus ¼ of an inch, then the Sender can be sure that the majority of Receivers can print the complete image  
 579 without loss of data. However, this does mean that there is the possibility that data may be lost.  
 580

581 Standard keyword values are defined in section 9.2.1.1.

#### 582 **7.2.1.1 media-supported Job Template Printer attributes**

583 The following standard keywords MUST be supported. Any other paper sizes supported MUST use the  
 584 self-describing names as defined in ([5101.1]):

585 ‘na\_letter\_8.5x11in’  
 586 ‘iso\_a4\_210x297mm’  
 587 ‘choice\_iso\_a4\_210x297mm\_na\_letter\_8.5x11in’ - represents both ‘na\_letter\_8.5x11in’ and  
 588 ‘iso\_a4\_210x297mm’ and indicates that either is acceptable. See [jobx].

#### 589 **7.3 Delivery Confirmation using the Print-job response**

590 The Sender knows when the Receiver has successfully received the entire Document when the Receiver  
 591 returns the ‘successful-ok’ status code in the Print-Job Response. The Sender MUST then inform the  
 592 Sending User by means outside the scope of this standard that the document has successfully been  
 593 received, unless the Sending User requests otherwise.

#### 594 **7.4 Originator identifier image**

595 The Sender MUST place an originator identifier, i.e., the value of the “sender-uri” attribute (see section  
 596 6.3), along with the date and time, in one of the following places, DEPENDING ON  
 597 IMPLEMENTATION:

- 598 1. On a cover page automatically generated by the Sender that is pre-pended before the first page  
 599 of user data in the PDF document.
- 600 2. Merged with the first page of the document.

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

Formatted: Bullets and Numbering

- 601 3. At the top of every page of the sent Document.  
 602 The Sender MAY include additional data (Sending User, Receiver identity, etc.).

603 **Reference PDF/is method.**

Formatted: Bullets and Numbering

## 604 **8 IPPFAX operations**

605 **Other IPP operations? I think not!**

606 Section **Error! Reference source not found.** defined the semantic requirements for the Get-Printer-  
 607 Attributes operation, section 1 defined the semantic requirements for Validate-Job, and section 7 defined  
 608 the semantic requirements for Print-Job operations for IPPFAX. This section defines the IPPFAX  
 609 semantics and conformance requirements for the other IPP operations.

610 IPPFAX restricts the use of IPP in certain cases in order to make attaching a Receiver to the Internet a safe  
 611 option – see section 9.

612 The Receiver MUST fully support the Print-Job, and Get-Printer-Attributes operations, as defined by this  
 613 document. The following subsections define restrictions and conformance requirements placed on the  
 614 Cancel-Job, Get-Job-Attributes, and Get-Jobs, operations. For a conforming IPPFAX Receiver  
 615 implementation, the support for each of the IPP operations is indicated in Table 5 and **Error! Reference**  
 616 **source not found.**

617 An IPPFax receiver MUST NOT support any optional features of IPP unless explicitly stated in this  
 618 document.

Formatted: Bullets and Numbering

### 619 **8.1 Operation Conformance Requirements**

620 Table 5 lists the conformance requirements for Printer operations for (1) an IPP/1.1 Printer ('ipp' URL), (2)  
 621 the non-privileged IPPFAX Sender, (3) an IPPFAX Receiver receiving a request from a non-privileged  
 622 User, and (4) an IPPFAX Receiver receiving a request from an authenticated and authorized operator or  
 623 administrator, if the Receiver supports operator/administrator authentication and authorization.

624 **Error! Reference source not found.** lists the conformance requirements for Job and Subscription  
 625 operations for (1) an IPP/1.1 Printer ('ipp') URL, (2) the non-privileged IPPFAX Sender which MUST be  
 626 on the same URL as the job was created (the target "printer-uri" MUST match the Job's "job-printer-uri"  
 627 Job Description attribute), (3) an IPPFAX Receiver receiving a request from the Job or Subscription Object  
 628 Owner, (4) from some other non-privileged user, and (5) if the operation is supported at all - from an  
 629 authenticated and authorized operator or administrator.



630 **Table 5 - Conformance for IPPFax/1.0 Operations**

Operation Name	IPPFAX Sender support for a User	IPPFAX Receiver from a User	IPPFAX Receiver from an Operator	Reference
Print-Job	MUST	MUST	MUST	section
Get-Jobs	MUST NOT	MUST NOT	MUST	section 8.4
Get-Printer-Attributes	MUST	MUST	MUST	sections <b>Error! Reference source not found.</b> , 5
Cancel-Job				
Get-Job-Attributes				

631 Legend:  
632

633 Legend:  
634 **MAY\*** - Get-Job-Attributes restricts certain. See section 8.4.  
635 **Owner** refers to the owner of the Job or Subscription object.

Formatted: Bullets and Numbering

636 **8.2 Print-Job operation**

637 **8.3 Cancel-Job operation**

638 Only Operators/Administrators can cancel IPPFax jobs.

Formatted: Bullets and Numbering

639 **8.4 Get-Job-Attributes and Get-Jobs operations**

640 Separate into two sections! Get-Jobs is Operator/Admin only operation

641 The public nature of IPPFAX interactions make it inappropriate for a client to be able to query a Receiver  
642 for certain information about jobs that it did not send.

643 The Receiver SHOULD restrict the job attributes that any Sender can request for any IPPFAX Job in a Get-  
644 Jobs or a Get-Job-Attributes operation to appropriate ones for a public service. For example, a Receiver  
645 MAY return only the following Job attributes:

- 646 job-id, job-uri
- 647 job-k-octets, job-k-octets-completed

648 job-media-sheets, job-media-sheets-completed,  
 649 time-at-creation, time-at-processing  
 650 job-state, job-state-reasons  
 651 **number-of-intervening-jobs – NOT!!!!**

652  
 653 The exact choice of Job attributes that a client can query for IPPFAX Jobs, including not returning any,  
 654 DEPENDS ON IMPLEMENTATION and the security policy in force and is outside the scope of this  
 655 standard (as in IPP/1.1).

656 This attribute set allows a client to determine the load on a Receiver (and perhaps choose an alternative  
 657 destination or warn the Sending User).

658 See the discussion in [RFC2911] section 8.4 for a description of how a Receiver MUST behave if it  
 659 receives a request for an attribute outside this set.

660 An IPP administrator MAY read all attributes.

Formatted: Bullets and Numbering

## 661 **9 Security considerations**

662 **IPPFAX presents an interesting challenge of balancing security and openness.** Many of the envisaged uses  
 663 of IPPFAX require confidentiality of the data – at the same time the Receiver typically has no prior  
 664 knowledge of the Sender or the Sending User. This last point will normally rule out all user-based  
 665 authentication and access control. This is the reason for the restrictions placed on querying and canceling  
 666 IPPFAX Jobs.

Formatted: Bullets and Numbering

### 667 **9.1 Data Integrity and authentication**

668 Any exchange between a Sender and a Receiver MUST be carried using the data integrity mechanism  
 669 specified in IPP/1.1 namely TLS/1.0 [RFC2246] or later versions of TLS.

670 A Receiver MUST have a TLS certificate and be authenticated by the sender.

671 A Sender MAY have a TLS certificate for client authentication. A Receiver MAY decide to reject  
 672 requests that come from Senders that do not have a TLS certificate and return the 'client-error-not-  
 673 authenticated' status code.

674 A Sender MAY use its own TLS certificate or it can use one associated with the Sending User.

675 A Receiver MUST have a TLS certificate, and the Send MUST have the public keys of the top level public  
 676 key Certificate Authorities (as current browsers do). If a Sender gets a public key from a Receiver that is

677 doesn't recognize, the Sender MUST resolve the unrecognized key or inform the Sending User that data  
678 integrity has been lost and MUST abort the job.

679 The distribution of private keys to Senders or Receivers is outside the scope of this document, but if it is  
680 done over the network, it MUST be over a secure channel. See Internet Key Exchange (IKE) [RFC2409].

681 **9.2 Data Privacy (encryption)**

682 A Sender MAY chose use data privacy (encryption) as defined in TLS/1.0 [RFC2246].

Formatted: Bullets and Numbering

683 **9.3 uri-authentication-supported (1setOf type2 keyword)**

684 This attribute (see [RFC2911] section 4.4.2) identifies the Client Authentication mechanism associated  
 685 with each URI listed in the “printer-uri-supported” attribute (see section 5.1).

686 **Table 6 - Authentication Requirements**

“uri-authentication-supported” keyword	Sender support and usage	Receiver support and usage
none	MAY support and MAY use	MAY support and MAY use. If the ‘none’ value is supported by an implementation, then the administrator MUST be able to configure the Printer to not support the ‘none’ value (by means outside the scope of this document)
requesting-user-name	MUST NOT	MUST NOT
basic	MAY support and MAY use when the TLS channel is secured with Data Privacy using the cipher suites indicated below* or stronger	MAY support and MAY use when the TLS channel is secured with Data Privacy using the cipher suites indicated below* or stronger
digest	MUST support and MUST use, including the MD5 and MD5-sess algorithms and Message Integrity, unless using ‘certificate’ or ‘negotiate’	MUST support and MAY use, including the MD5 and MD5-sess algorithms and Message Integrity
certificate	SHOULD support and MAY use when not using any of the above	MUST support and MAY use. For this value, the Receiver MUST validate the certificate for all client requests

687 \* TLS\_DHE\_DSS\_WITH\_3DES\_EDE\_CBC\_SHA mandated by [RFC2246].

688 Table 7 compares the Digest Authentication requirements for IPP/1.1 clients, IPP/1.1 Printers, IPPFAX  
689 Senders, and IPPFAX Receivers.

690 **Table 7 - Digest Authentication Conformance Requirements**

Feature	IPP/1.1 Client	IPP/1.1 Printer	IPPFAX Sender	IPPFAX Receiver
MD5 and MD5-sess	must support must use	should support should use	MUST support MUST use	MUST support MUST use
The Message Integrity feature	must support may use	should support may use	MUST support MUST use	MUST support MUST use

691

Formatted: Bullets and Numbering

692 **9.4 uri-security-supported (1setOf type2 keyword)**

693 This attribute (see [RFC2911] section 4.4.3) identifies the security (Integrity and Privacy) mechanisms  
694 used for each URI listed in the “printer-uri-supported” attribute (see section 5.1).

695 **Table 8 - Security (Integrity and Privacy) Requirements**

uri-security-supported	Sender support and usage	Receiver support and usage
none	MUST NOT	MUST NOT
ssl2	MUST NOT	MUST NOT
ssl3	MUST NOT	MUST NOT
tls	TLS Data Integrity - MUST support and MUST use	MUST support and MUST use
	TLS Data Privacy - MUST support and MAY use. The Sender (device) MUST query the Sending User (human) before omitting Privacy (encryption).	MUST support and MAY use

696

697 Table 9 compares the TLS conformance requirements for IPP/1.1 clients, IPP/1.1 Printers, IPPFAX  
698 Senders, and IPPFAX Receivers.

699 **Table 9 - Transport Layer Security (TLS) Conformance Requirements**

TLS Feature	IPP/1.1 Client	IPP/1.1 Printer	IPPFAX Sender	IPPFAX Receiver
Server Authentication	must support should use	should support may use	MUST use	MUST support
Client Authentication*	may support may use	may support may use	SHOULD support	MUST support MAY use
Data Integrity	may support may use	should support should use	MUST use	MUST support
Data Privacy	may support may use	should support may use	MUST support MAY** use.	MUST support

700 \* The 'certificate' keyword value for the "uri-authentication-supported" attribute [RFC2911].

701 \*\* The Sender MUST query the Sending User before omitting the Data Privacy encryption.

702 Senders and Receivers MUST support the TLS\_DHE\_DSS\_WITH\_3DES\_EDE\_CBC\_SHA cipher suite as  
703 mandated by RFC 2246 [RFC2246]. All stronger cipher suites are OPTIONAL; weaker cipher suites  
704 MUST NOT be supported or used by Senders or Receivers.

705 A Receiver MAY support Basic Authentication (described in HTTP/1.1 [RFC2617]) for Client  
706 Authentication if the TLS channel is secured with Data Privacy. TLS with the above mandated cipher suite  
707 or stronger can provide such a secure channel.

Formatted: Bullets and Numbering

## 708 **9.5 Using IPPFAX with TLS**

709 The Sender MUST use only TLS for all IPPFAX operations on the IPPFAX URL. The client MUST start  
710 the transaction in TLS, rather than using HTTP upgrade requests. The following paragraph of [RFC2818]  
711 further explains:

712 The agent acting as the HTTP client should also act as the TLS client. It should initiate a  
713 connection to the server on the appropriate port and then send the TLS ClientHello to begin the TLS  
714 handshake. When the TLS handshake has finished. The client may then initiate the first HTTP  
715 request. All HTTP data MUST be sent as TLS "application data". Normal HTTP behavior,  
716 including retained connections should be followed.

717 Contrast this IPPFAX requirement with the IPP requirement in section 8.2 of [RFC2910]. The following  
718 client actions compare IPP with IPPFAX from a client's point of view:

- 719 IPP/1.1 sequence:
- 720 1. Start TCP connection
  - 721 2. Zero or more HTTP/IPP requests
  - 722 3. HTTP/IPP request with Upgrade to TLS header
  - 723 4. TLS handshake
  - 724 5. Finish the HTTP/IPP request securely
  - 725 6. Send more HTTP/IPP requests securely ...

- 726 IPPFAX sequence:
- 728 1. Start TCP connection
  - 729 2. Send TLS ClientHello
  - 730 3. Rest of TLS handshake
  - 731 4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
  - 732 followed by the Print-Job operation).
  - 733

Formatted: Bullets and Numbering

## 734 **9.6 Access control**

735 Needs re-writting

736 It is expected that the majority of IPPFAX Receivers will operate in a public mode when operating on the  
 737 Internet, so that anonymous users can send documents without requiring client authentication  
 738 (corresponding to the 'none' value for the "uri-authentication-supported" attribute - see section 9.3).  
 739 However a Receiver MAY protect itself using any Client Authentication method specified in [RFC2911]  
 740 (digest authentication [RFC2069] for example) to restrict access to any or all of its functionality.

741 However, the primary intent of IPPFAX is to create a controlled public access mode. It therefore does not  
 742 really make much sense to combine IPPFAX and user authentication; they are achieving the same thing.

Formatted: Bullets and Numbering

## 743 **9.7 Reduced feature set**

744 Needs re-writting

745 An administrator or device implementer MAY choose to setup up a Print Service so that it only works as an  
 746 IPPFAX Receiver (i.e., offers no 'native' IPP operations and does not accept IPP Jobs). In this mode it  
 747 offers a restricted set of features and MAY be more safely connected to the Internet.

748 A Receiver that is operating in this mode MUST do so by rejecting any non-IPPFAX request and return a  
 749 'client-error-attributes-or-values-not-supported' error status code as indicated in section 4.1 for an  
 750 unsupported value of the "printer-uri" operation attribute. For job operations attempted on IPPFAX Jobs,

751 the Receiver MUST return the 'client-error-not-authorized' error status code, unless the Sender is  
752 authenticated as the system administrator and the Receiver supports such access.

Formatted: Bullets and Numbering

## 753 **10 Attribute Syntaxes**

754 No new attribute syntaxes are defined.

Formatted: Bullets and Numbering

## 755 **11 Status codes**

756 No new Status codes are defined and semantics for existing status codes have not been modified.

757 .

Formatted: Bullets and Numbering

## 758 **12 Conformance Requirements**

759 **Need to be re-worked.**

760 This section summarizes the conformance requirements for Senders and Receivers that are defined  
761 elsewhere in this document.

- 762 1. A Sender and Receiver MUST observe the attribute name space conventions specified in section  
763 **Error! Reference source not found..**
- 764 2. The Sender MUST supply and the Receiver MUST support (1) the "printer-uri" operation attribute  
765 with the 'ippfax' scheme, (2) the "version-number" parameter with the IPP/1.1 '1.1' (or higher  
766 minor version) value, and (3) the "ippfax-version" operation attribute with the IPPFAX/1.0 '1.0'  
767 keyword value in all operations to get the IPPFAX semantics as described in section 4.
- 768 3. The Receiver MUST support the Get-Printer-Attributes operation as described in sections **Error!**  
769 **Reference source not found..**
- 770 4. The Receiver MUST support the Printer Description attributes as specified in section 5.
- 771 5. **The Sender MUST validate that the target Printer is IPPFAX-capable using the Get-Printer-**  
772 **Attributes operation and validate that the Receiver supports the job using the Validate-Job operation**  
773 **as specified in section 1.**
- 774 6. The Sender MUST supply and the Receiver MUST support the operation/Job Description attributes  
775 for Identify Exchange as described in section 6.



- 776 7. The Sender MUST support submitting and the Receiver MUST accept IPPFAX Jobs as defined in  
777 section 7.
- 778 8. The Sender MUST place the Sender's identity in the document according to section **Error!**  
779 **Reference source not found.**
- 780 9. The Sender and Receiver MUST support the operations as indicated in section 8.
- 781 10. The Sender and Receiver MUST support the security mechanisms indicated in section 9, including  
782 TLS.

783 The [set-ops], enable-printer and disable-printer operations MUST only be preformed on a connection that  
784 has been authenticated by TLS and the user has the rights to perform them.

Formatted: Bullets and Numbering

## 785 **13 IPPFAX URL Scheme**

786 **Need to be re-worked to be consistent RFC 3510**

787 **Need to register a port with IANA for IPPFax.**

788 This section is intended for use in registering the 'ippfax' URL scheme with IANA and fully conforms to  
789 the requirements in [RFC2717].

Formatted: Bullets and Numbering

### 790 **13.1 IPPFAX URL Scheme Applicability and Intended Usage**

791 This document defines the 'ippfax' URL (Uniform Resource Locator) scheme for specifying the location of  
792 an IPPFAX Receiver which implements the IPPFAX Protocol specified in this document.

793 The 'ippfax' URL scheme defined in this document is based on the ABNF for the basic hierarchical URL  
794 syntax in [RFC2396]; however relative URL forms, parameters, and/or query parts are NOT allowed in an  
795 IPPFAX URL. The 'ippfax' URL scheme is case-insensitive in the host name or host address part;  
796 however the path part is case-sensitive, as in [RFC2396]. Codepoints outside [US-ASCII] MUST be hex  
797 escaped by the mechanism defined in [RFC2396].

798 The intended usage of the 'ippfax' URL scheme is COMMON.

Formatted: Bullets and Numbering

### 799 **13.2 IPPFAX URL Scheme Associated IPPFAX Port**

800 All IPPFAX URLs which do NOT explicitly specify a port MUST be used over IANA-assigned well-  
801 known port **xxx [TBA by IANA]** for the IPPFAX Protocol.

802 See: IANA Port Numbers Registry [IANA-PORTREG].

Formatted: Bullets and Numbering

### 803 **13.3 IPPFAX URL Scheme Associated MIME Type**

804 All IPPFAX protocol operations (requests and responses) MUST be conveyed in an ‘application/ipp’  
805 MIME media type [RFC2910] as registered in [IANA-MT]. IPPFAX URLs MUST refer to IPPFAX  
806 Receivers which support this ‘application/ipp’ operation encoding.

807 See: IANA MIME Media Types Registry [IANA-MT].

Formatted: Bullets and Numbering

### 808 **13.4 IPPFAX URL Scheme Character Encoding**

809 The IPPFAX URL scheme defined in this document is based on the ABNF for the HTTP URL scheme  
810 defined in HTTP/1.1 [RFC2616], which is derived from the URI Generic Syntax [RFC2396] and further  
811 updated by [RFC2732] and [RFC2373] (for IPv6 addresses in URLs). The IPPFAX URL scheme is case-  
812 insensitive in the ‘scheme’ and ‘host’ (host name or host address) part; however, the ‘abs\_path’ part is  
813 case-sensitive, as in [RFC2396]. Code points outside [US-ASCII] MUST be hex escaped by the  
814 mechanism specified in [RFC2396].

Formatted: Bullets and Numbering

### 815 **13.5 IPPFAX URL Scheme Syntax in ABNF**

816 The IPP protocol places a limit of 1023 octets (NOT characters) on the length of a URI (see section 4.1.5  
817 ‘uri’ in [RFC2911]). An IPPFAX Receiver MUST return ‘client-error-request-value-too-long’ (see section  
818 13.1.4.10 in [RFC2911]) when a URI received in a request is too long.

819 Note: IPPFAX Receivers ought to be cautious about depending on URI lengths above 255 bytes, because  
820 some older client or proxy implementations might not properly support these lengths.

821 IPPFAX URLs MUST be represented in absolute form. Absolute URLs always begin with a scheme name  
822 followed by a colon. For definitive information on URL syntax and semantics, see “Uniform Resource  
823 Identifiers (URI): Generic Syntax and Semantics” [RFC2396]. This specification adopts the definitions of  
824 “port”, “host”, “abs\_path”, and “query” from [RFC2396], as updated by [RFC2732] and [RFC2373] (for  
825 IPv6 addresses in URLs).

826 The IPPFAX URL scheme syntax in ABNF is as follows:

```
827 ippfax_URL = "ippfax:" "//" host [ ":" port ] [ abs_path [ "?" query ] ]
```

828

829 If the port is empty or not given, the IANA-assigned port as defined in section 13.2 is assumed. The  
830 semantics are that the identified resource (see section 5.1.2 of [RFC2616]) is located at the IPPFAX

831 Notification Recipient listening for HTTP connections on that port of that host, and the Request-URI for  
832 the identified resource is 'abs\_path'.

833 Note: The use of IP addresses in URLs SHOULD be avoided whenever possible (see [RFC1900]).

834 If the 'abs\_path' is not present in the URL, it MUST be given as "/" when used as a Request-URI for a  
835 resource (see section 5.1.2 of [RFC2616]). If a proxy receives a host name which is not a fully qualified  
836 domain name, it MAY add its domain to the host name it received. If a proxy receives a fully qualified  
837 domain name, the proxy MUST NOT change the host name.

Formatted: Bullets and Numbering

### 838 **13.6 IPPFAX URL Examples**

839 The following are examples of valid IPPFAX **URLs for Notification Recipient** objects (using DNS host  
840 names):

```
841     ippfax://abc.com
842     ippfax://abc.com/listener
```

844 Note: The use of IP addresses in URLs SHOULD be avoided whenever possible (see [RFC1900]).

845 The following literal IPv4 addresses:

```
846     192.9.5.5           ; IPv4 address in IPv4 style
847     186.7.8.9           ; IPv4 address in IPv4 style
```

849 are represented in the following example IPPFAX URLs:

```
850     ippfax://192.9.5.5/listener
851     ippfax://186.7.8.9/listeners/tom
```

853 The following literal IPv6 addresses (conformant to [RFC2373]):

```
854     ::192.9.5.5         ; IPv4 address in IPv6 style
855     ::FFFF:129.144.52.38 ; IPv4 address in IPv6 style
856     2010:836B:4179::836B:4179 ; IPv6 address per RFC 2373
```

858 are represented in the following example IPPFAX URLs:

```
859     ippfax://[::192.9.5.5]/listener
860     ippfax://[::FFFF:129.144.52.38]/listener
861     ippfax://[2010:836B:4179::836B:4179]/listeners/tom
```

863 **13.7 IPPFAX URL Comparisons**

Formatted: Bullets and Numbering

864 When comparing two IPPFAX URLs to decide if they match or not, the comparer MUST use the same  
865 rules as those defined for HTTP URI comparisons in [RFC2616], with the sole following exception:

- 866 • A port that is empty or not given MUST be treated as equivalent to the port as defined in section  
867 13.2 for that IPPFAX URL;

Formatted: Bullets and Numbering

868 **14 IANA Considerations**

869 IANA shall register the ippfax URL scheme as defined in section 13 according to the procedures of  
870 [RFC2717] and assign a well known port.

871 Operation Attributes:

872 ippfax-version (type2 keyword) IEEE-ISTO 510n.y 4.3

873

874 Operation/Job Description attributes:

875 sending-user-vcard (text (MAX)) IEEE-ISTO 510n.y 6.1

876 receiving-user-vcard (text (MAX)) IEEE-ISTO 510n.y 6.2

877 sender-uri (uri) IEEE-ISTO 510n.y 6.3

878

879 Printer Description Attributes:

880 ippfax-versions-supported (1setOf type2 keyword) IEEE-ISTO 510n.y 5.3

Formatted: Bullets and Numbering

881 **15 References**882 **15.1 Normative**

883 [IANA-MT]

884 IANA Registry of Media Types: <ftp://ftp.iana.org/iana/assignments/media-types/>.

885 [IANA-PORTREG]

886 IANA Port Numbers Registry. <ftp://ftp.isi.edu/in-notes/iana/assignments/port-numbers>.

887 [PWG5102.3-2004]

888 Seeler, R., "PDF Image-Streamable (PDF/is)", Work in Progress,

889 <ftp://pwg.org/pub/pwg/QUALDOCS/pwg-ifx-pdfis-latest.pdf>.

890

891 [jobx]

892 Hastings, T. and P. Zehler, "IPP Job Extensions", May 19, 2000,

893 [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_JOBX/wd-ippjobx10-20030518.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030518.pdf), work in progress.

894

895 **15.2 Informative**

896

897 [ifx-req]

898 Moore, P., "IPP Fax transport requirements", October 16, 2000,

899 <ftp://ftp.pwg.org/pub/pwg/QUALDOCS/requirements/ifx-transport-requirements-01.pdf>.

900

901

902 [RFC2542]

903 Masinter, "Terminology and Goals for Internet Fax", RFC2542.

904 [RFC3380]

905 Kugler, C, Hastings, T., Lewis, H., "Internet Printing Protocol (IPP): Job and Printer Administrative  
906 Operations", <draft-ietf-RFC3380-03.txt>, July 17, 2001.

907 [RFC 3382]

908 deBry, R., , Hastings, T., Herriot, R., "Internet Printing Protocol (IPP): collection attribute  
909 syntax", RFC 3382, September, 2002 .

910 [ipp-get-method]

911 Herriot, Kugler, and Lewis, "The 'ippget' Delivery Method for Event Notifications" , <draft-ietf-  
912 ipp-notify-get-06.txt>, November 19, 2001.

913 [ipp-iig-bis]

914 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1:  
915 Implementer's Guide", draft-ietf-ipp-implementers-guide-v11-04.txt, work in progress, intended to  
916 obsolete RFC 3196 [RFC3196], October 8, 2001.

917 [RFC 3381]

918 Hastings, T., Bergman, R., Lewis, H., "Internet Printing Protocol (IPP): Job Progress Attributes",  
919 RFC 3381, September, 2002.

920 [ipp-ntfy]

921 Isaacson, S., Martin, J., deBry, R., Hastings, T., Shepherd, M., Bergman, R., "Internet Printing  
922 Protocol/1.1: IPP Event Notification Specification", <draft-ietf-ipp-not-spec-08.txt>, November 19,  
923 2001.Formatted: Bullets and Numbering

- 924 [ipp-output-bin]  
925 Hastings, T., and R. Bergman, "Internet Printing Protocol (IPP): output-bin attribute extension",  
926 IEEE-ISTO 5100.2-2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf>.
- 927 [ipp-prod-print]  
928 Ocke, K., Hastings, T., "Internet Printing Protocol (IPP): Production Printing Attributes - Set1",  
929 IEEE-ISTO 5100.3-2001, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>.
- 930 [ipp-set-ops]  
931 Hastings, Herriot, Kugler, and Lewis, "Job and Printer Set Operations", <draft-ietf-ipp-job-printer-  
932 set-ops-05.txt>, August 28, 2001.
- 933 [ipp-uri-scheme]  
934 Herriot, McDonald, "IPP URL Scheme", <draft-ietf-ipp-url-scheme-03.txt>, April 3, 2001.
- 935 [pwg-media]  
936 Bergman, Hastings, "Media Standardized Names", work in progress, when approved:  
937 <ftp://ftp.pwg.org/pub/pwg/standards/pwg5101.1.pdf>; current draft:  
938 <ftp://ftp.pwg.org/pub/pwg/media-sizes/pwg-media-12.pdf>, September 24, 2001.
- 939 [RFC1900]  
940 B. Carpenter, Y. Rekhter. Renumbering Needs Work, RFC 1900, February 1996.
- 941 [RFC2069]  
942 Franks, Hallam-Baker, Hostetler, Leach, Luotonen., Sink, Stewart, "An Extension to HTTP: Digest  
943 Access Authentication", RFC2069.
- 944 [RFC2119]  
945 Bradner, S., "Key words for use in RFCs to Indicate Requirement Level", RFC2119.
- 946 [RFC2246]  
947 Dierks, Allen "The TLS Protocol Version 1.0", RFC 2246.
- 948 [RFC2305]  
949 Toyoda, Ohno, Murai, Wing "A Simple Mode of Facsimile Using Internet Mail", RFC2305.
- 950 [RFC2373]  
951 R. Hinden, S. Deering. IP Version 6 Addressing Architecture, RFC 2373, July 1998.
- 952 [RFC2396]  
953 Berners-Lee, T. et al. Uniform Resource Identifiers (URI): Generic Syntax, RFC 2396, August  
954 1998.

- 955 [RFC2409]  
956 Harkins, D., and D. Carrel, "The Internet Key Exchange (IKE)", RFC 2409, November 1998.
- 957 [RFC2425]  
958 T. Howes, M. Smith, F. Dawson, "A MIME Content-Type for Directory Information", RFC 2425,  
959 September 1998.
- 960 [RFC2426]  
961 Dawson, Howes, "vCard MIME Directory Profile", RFC 2426, September 1998 [version v3.0].
- 962 [RFC2532]  
963 Masinter, Wing, "Extended Facsimile Using Internet Mail", RFC2532.
- 964 [RFC2616]  
965 R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, "Hypertext  
966 Transfer Protocol - HTTP/1.1", RFC 2616, June 1999.
- 967 [RFC2617]  
968 J. Franks, P. Hallam-Baker, J. Hostetler, S. Lawrence, P. Leach, A. Luotonen, L. Stewart, "HTTP  
969 Authentication: Basic and Digest Access Authentication", RFC 2617, June 1999.
- 970 [RFC2732]  
971 R. Hinden, B. Carpenter, L. Masinter. Format for Literal IPv6 Addresses in URL's, RFC 2732,  
972 December 1999.
- 973 [RFC2818]  
974 E. Rescorla, "HTTP Over TLS", May 2000.
- 975 [RFC2910]  
976 Herriot, Butler, Moore, Turner, Wenn, "Internet Printing Protocol/1.1: Encoding and Transport",  
977 RFC2910, September 2000.
- 978 [RFC2911]  
979 deBry, Hastings, Herriot, Isaacson, Powell, "Internet Printing Protocol/1.1: Model and Semantics",  
980 RFC2911, September 2000.
- 981 [RFC3196]  
982 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1:  
983 Implementer's Guide", RFC 3196, November, 2001.
- 984 [X509]  
985 CCITT. Recommendation X.509: "The Directory - Authentication Framework", 1988.

**16 Authors' addresses**

Formatted: Bullets and Numbering

<p>Thomas N. Hastings Xerox Corporation 701 Aviation Blvd. El Segundo, CA 90245</p> <p>Phone: +1 310-333-6413 FAX: +1 310-333-5514 email: <a href="mailto:hastings@cp10.es.xerox.com">hastings@cp10.es.xerox.com</a></p>	<p>Ira McDonald High North Inc 221 Ridge Ave Grand Marais, MI 49839</p> <p>Phone: +1 906-494-2434 Email: <a href="mailto:imcdonald@sharplabs.com">imcdonald@sharplabs.com</a></p>
	<p>Gail Songer Peerless Systems Corp 2381 Rosecrans Ave El Segundo, CA 90245</p> <p>Phone: +1 650-358 8875 Email: <a href="mailto:gsonger@peerless.com">gsonger@peerless.com</a></p>
<p>Dennis Carney IBM 6300 Diagonal Highway Boulder, CO 80301</p> <p>Phone: +1 303-924-0565 Email: <a href="mailto:dcarney@us.ibm.com">dcarney@us.ibm.com</a></p>	<p>Rick Seeler Adobe Systems Incorporated 321 Park Ave. San Jose, CA 95110</p> <p>Phone: +1 408- 536-4393 Email: <a href="mailto:rseeler@adobe.com">rseeler@adobe.com</a></p>

987  
988  
989  
990  
991  
992  
993  
994  
995

## Contact Information:

IPPFAX Web Page: <http://www.pwg.org/qualdocs/>  
IPPFAX Mailing List: [ifx@pwg.org](mailto:ifx@pwg.org)

To subscribe to the IPPFAX mailing list, send the following email:

- 1) send it to [majordomo@pwg.org](mailto:majordomo@pwg.org)
- 2) leave the subject line blank



996 3) put the following two lines in the message body:  
 997 subscribe ifx  
 998 end  
 999

1000 Implementers of this specification document are encouraged to join the IPPFAX Mailing List in order  
 1001 to participate in any discussions of clarification issues and review of registration proposals for  
 1002 additional attributes and values. In order to reduce spam the mailing list rejects mail from non-  
 1003 subscribers, so you must subscribe to the mailing list in order to send a question or comment to the  
 1004 mailing list.

1005  
 1006 Other Participants:

Aisushi Uchino - Epson	Marty Joel - Peerless
Bill Wagner - NetSilicon/DPI	Michael Wu - Heidelberg Digital
Carl-Uno Manros - Xerox	Mike Kuindersma - PrinterOn
Charles Kong - Panasonic	Norbert Schade - Oak Technology
Dan Calle - Digital Paper	Patrick Pidduck - PrinterOn
David Kellerman - Northlake	Peter Zehler - Xerox
Don Wright - Lexmark	Rich Heckelmann - Panasonic USA
Elliott Bradshaw - Oak Technologies	Richard Shockey - Newstar
Frank Martin - Brother	Rob Buckley - Xerox
Fumio Nagasaka - Epson	Robert Herriot - Xerox
Geoff Soord - Software 2000	Roelop Hamberg - Océ
Harry Lewis - IBM	Ron Bergman - Hitachi Koki
Howard Sidorski - Netreon	Satoshi Fujitani - Ricoh
Hugo Parra - Novell	Shigeru Ueda - Canon
Jeff Christensen - Novell	Shinichi Tsuruyama - Epson
Jerry Thrasher - Lexmark	Stuart Rowley - Kyocera
John Thomas - Sharp Labs	Ted Tronson - Novell
Koichi "Hurry" Izuhara - Minolta	Toru Maeda - Canon
Lee Farrell - Canon Info Systems	Yiruo Yang - Epson
Lloyd McIntyre	Yuji Sasaki - JCI
Mark VanderWiele - IBM	Paul Moore -
John Pulera - Minolta	

1007  
 1008 1. Appendix A:

1009 **17 Appendix B: vCard Example**

Formatted: Bullets and Numbering

1010 **Update the example**

1011 The following ASCII text is a complete vCard v3.0 [RFC2426, RFC2425] example:

```

1012 BEGIN:VCARD
1013 VERSION:3.0
1014 N:Moore;Paul
1015 FN:Paul Moore
1016 ORG:Netreon
1017 TEL;CELL;VOICE:1+206-251-7008
1018 ADR;WORK;;;10900 NE 8th St;Bellvue;WA;98004;United States of America
1019 EMAIL;PREF;INTERNET:pmoore@netreon.com
1020 REV:19991207T215341Z
1021 END:VCARD
1022
1023

```

Formatted: Bullets and Numbering

1024 **18 Revision History (to be removed when standard is approved)**

Revision	Date	Author	Notes
1	1/16/01	Paul Moore, Netreon	Initial version
2	2/27/01	Paul Moore, Gail Songer, Netreon	Specify TLS as MUST Removed Cover page and combined device Added need for big text types
3	4/11/01	Gail Songer, Netreon	Move attribute definition to first reference
4	5/24/01	Tom Hastings	Editorially updated the document to follow the style of the IPP standard documents. Added 23 issues to be reviewed. Capitalized the special terms throughout without showing revisions in order to make the document with revisions more readable.
5	5/21/01	Tom Hastings, John Pulera, Ira McDonald	Updated from the 6/6/01 telecon agreements on most of the 23 issues. There are 20 issues remaining, mostly new.
6	7/27/01	Tom Hastings, Ira McDonald	Updated from the 6/29/01 telecon. There are 41 issues remaining, mostly new.
7	10/8/01	Tom Hastings, Ira McDonald	Updated with all the resolutions to the 41 ISSUES from the August 1, 2001 IPPFAX WG meeting in

			Toronto, and the subsequent telecons: August, 9, 14, and 17, 2001. There are 4 (new) issues remaining.
8	11/17/01	Tom Hastings	Updated with the agreements from the IPPFAX WG meeting, 10/24/01, Texas. See minutes. There are 5 issues remaining.
9	12/31/01	Tom Hastings	Updated with the agreements reached at the 12/14/01 telecon.
10	2/19/02	Tom Hastings	Updated with the agreements reached as the 2/5/02 IPPFAX WG meeting. There are no remaining issues.
11	9/20/02	Tom Hastings	Replaced all occurrences of UIF with PDFax and uif with PDFax.
12	10/16/02 10/24/02	Rick Seeler Gail Songer	Updated to reflect PDF/is as file format. Replace CONNEG with UPDF. Attributes for OPTIONAL PDF/is functionality.
13	11/22/02	Rick Seeler	Replaced 'PDFax' with 'PDF/is' or 'pdfis'. Updated spec to match 0.3 PDF/is specification.
14	03/18/03	Gail Songer	Removed pdfis-profile-requested and pdfis-profile-supported and pdfis-profiles; all image formats are required Removed pdfis-cache-size-k-octets (now fixed value) Removed pdfis-banding-direction-supported Started to split references into two sections, "normative" and "informative" and update descriptions to references Other editorial changes
15	03/24/03	Gail Songer	Added digital-signatures-supported. Added pdf-format and pdf-format supported. Put "coloring" back to optional. Removed PDF data encryption (leave for a future version of PDF/is and IPPFax)
16		Gail Songer Dennis Carney	Remove all references to coloring Changed pdf-format to document-format-version Remove the requirement that [set-ops] supports document-format coloring (we only allow document-format==PDF) ALL admin operations require TLS to have authenticated the user and the user has admin rights Other editorial changes
17	05/21/03	Dennis Carney	Editorial updates

	05/28/03	Tom Hastings	Added new 'choice_iso_a4_210x297mm_na_letter_8.5x11in' value for "media" and a reference to [jobx]. Fixed conformance for "media-ready".
18	10/03 11/03	Gail Songer	Reviewed in light of the Requirements specification. Noted lots of places in which the document MUST be changed.

1025

1026

**Allow Cancel-job for Administrators.**

NOTE: RFC2911 only requires that the attribute be supported but the supported may be not-attempted

## 6 Sender Validation of the Receiver's Capabilities

This section describes how a Sender MUST first validate the target Printer as a Receiver and determines its basic capabilities (section 6.1) and then validate the IPPFAX Job (section **Error! Reference source not found.**).

NOTE: This WHOLE section needs revision and possible wholesale deletion

### 6.1 Sender Validates the target Printer as a Receiver and determines its basic capabilities

The order of presentation in Table 2 is the likely order that a Sender would check the values, though the Sender can request all of the attributes in a single Get-Printer-Attributes operation (and the Receiver MAY return them in any order as specified in [RFC2911]).

Table 2 - Receiver Attributes that the Sender validates with Get-Printer-Attributes

Attribute	Ref.	Sender action
Operation attributes:		
printer-uri	4.1	Sender MUST validate whether or not the Get-Printer-Attributes operation with a "printer-uri" target URL using the 'ippfax' scheme locates a valid Receiver destination.
Printer Description attributes:		
ippfax-versions-supported	5.3	Sender MUST check whether the Printer supports the IPPFAX Protocol on the target URL by checking whether or not the Printer supports this attribute, i.e., validate that the Printer is a Receiver.
document-format-version-supported	5.6	If the Sender would like to use a document format other than PDF/is, then the Sender MUST verify that the desired version of PDF is supported by the Receiver..
Job Template Printer attributes:		
media-supported	8.2.1.1	If the Sending user requests a paper size other than iso_a4_210x297mm or na_letter_8.5x11in then the Sender MUST verify that the requested paper size is supported by the receiver
printer-resolutions-supported	<b>Error! Reference source not found.</b>	Sender SHOULD check which resolutions are supported, so that it can use the highest resolution supported by the Receiver.

Table needs review