

1
2
3
4
5
6
7
8
9

IEEE-ISTO

Printer Working Group

IPP Fax Project

Standard for IPPFAX/1.0 Protocol

Working Draft

Maturity: Initial



16
17
18
19
20
21
22
23
24
25
26
27
28

Version 1.0
February 18, 2004

29
30
31
32

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

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

The IPPFAX/1.0 protocol is a specialization of the IPP/1.1 [RFC2911], [RFC2910] protocol supporting a subset of the IPP operations with increased conformance requirements in some cases, some restrictions in other cases, and some additional REQUIRED attributes. The IPPFAX Protocol uses the 'ippfax' URL scheme (instead of the 'ipp' URL scheme) in all its operations. Most of the new attributes defined in this document MAY be supported by IPP Printers as OPTIONAL extensions to IPP as well. An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least the PDF/IS as specified in [PWG5102.3-2004] which is defined for the 'application/pdf' document format MIME type. A Print System MAY be configured to support both the IPPFAX and IPP protocols concurrently, but each protocol requires separate Printer objects with distinct URLs.

This document is available electronically at: [wd-ifx10-20040218.pdf, .doc](#)

A version showing the changes from the previous version is available at: [wd-ifx10-20040218-rev.pdf](#)

The latest version of this specification is available at: [ftp://pwg.org/pub/pwg/QUALDOCS/wd-ifx10-latest.pdf, .doc](http://pwg.org/pub/pwg/QUALDOCS/wd-ifx10-latest.pdf)

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.

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

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

86 1) send it to 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	Error! Bookmark not defined.
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	17
122	7 Submission using Print-Job	17
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	19
126	7.1.3 document-format-version (type2 keyword) operation attribute	19
127	7.2 Job Template Attributes (for Print-Job)	20
128	7.2.1 media (type2 keyword name(MAX)) Job Template	22
129	7.3 Delivery Confirmation using the Print-job response	22

130	7.4 Originator identifier image.....	23
131	8 IPPFAX operations.....	23
132	8.1 Operation Conformance Requirements	23
133	8.2 Print-Job operation	24
134	8.3 Cancel-Job operation.....	24
135	8.4 Get-Job-Attributes and Get-Jobs operations	24
136	9 Security considerations.....	25
137	9.1 Data Integrity and authentication	25
138	9.2 Data Privacy (encryption)	26
139	9.3 uri-authentication-supported (1setOf type2 keyword)	27
140	9.4 uri-security-supported (1setOf type2 keyword)	28
141	9.5 Using IPPFAX with TLS.....	29
142	9.6 Access control	30
143	9.7 Reduced feature set.....	30
144	10 Attribute Syntaxes	31
145	11 Status codes	31
146	12 Conformance Requirements	31
147	13 IPPFAX URL Scheme.....	32
148	13.1 IPPFAX URL Scheme Applicability and Intended Usage.....	32
149	13.2 IPPFAX URL Scheme Associated IPPFAX Port.....	32
150	13.3 IPPFAX URL Scheme Associated MIME Type	33
151	13.4 IPPFAX URL Scheme Character Encoding.....	33
152	13.5 IPPFAX URL Scheme Syntax in ABNF	33
153	13.6 IPPFAX URL Examples.....	34
154	13.7 IPPFAX URL Comparisons	35
155	14 IANA Considerations	35
156	15 References	35
157	15.1 Normative.....	35
158	15.2 Informative	36
159	16 Authors' addresses.....	39
160	17 Appendix B: vCard Example.....	41

161 18 Revision History (to be removed when standard is approved) 41

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.**Error! Bookmark**

166 **not defined.**

167 Table 3 - Summary of Identify Exchange attributes 17

168 Table 4 - [RFC 2911] Print-Job operation attributes..... 18

169 Table 5 - IPPFAX Semantics for Job Template Attributes 21

170 Table 6 - Conformance for IPPFax/1.0 Operations..... 24

171 Table 8 - Authentication Requirements..... 27

172 Table 9 - Digest Authentication Conformance Requirements 28

173 Table 10 - Security (Integrity and Privacy) Requirements..... 28

174 Table 11 - Transport Layer Security (TLS) Conformance Requirements..... 29

175

176 **1 Introduction**

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

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

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

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

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

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

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

204 **1.1 Operations Supported**

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

206

- 207 1. Get-Printer-Attributes - If the document-format-version is not PDF/is or the media is not
208 iso_a4_210x297mm or na_letter_8.5x11in, then the Sender MUST verify that the Receiver can
209 support the alternate attributes. Rational: Using Get-Printer-Attributes would avoid rejection of
210 the job which is important if the document data is very large.
- 211 2. Print-Job - Sender MUST submit the IPPFAX job with a single document (Create-Job, Send-
212 document and Send-URI and Print-URI MUST NOT be supported by Senders or Receivers).
- 213 3. Get-Job-Attributes - The Sender MUST support and MUST use this operation to check for
214 successful job completion unless the Sending User wishes otherwise. Job-History MUST be
215 retained by the Receiver for at least 5 minutes after job completion. See 4.3.7.2 of RFC2911 for
216 printer object Job-History discussion.
- 217 4. Job-Cancel – Receivers MUST support this operation but only for authenticated Administrators
218 or Operators.
- 219 All IPPFax Senders and Receivers MUST NOT support any other IPP operations including job
220 operations and administrative operation.

221 1.2 Typical exchange

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

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

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

243 **2 Terminology**

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

245 **2.1 Conformance Terminology**

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

253 **2.2 Other Terminology**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

296 **IPP Job** A job submitted by an IPP client to an IPP Printer object using the IPP Protocol.

297 **IPPFAX Job** A job submitted by a Sender to a Receiver using the IPPFAX Protocol.

298 **PDF/is** The file format defined by [PWG5102.3-2004].

299 The terminology defined in [RFC2911], such as **attribute**, **operation**, **request**, **response**, **operation**
300 **attribute**, **Printer Description attribute**, **Job Description attribute**, **integrity**, and **privacy** is also used
301 in this document with the same capitalization conventions and semantics.

302 **3 IPPFAX Model**

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

304 **3.1 Printer Object Relationships**

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

310 **3.2 A Printer object with multiple URLs**

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

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

319

320 **4 Common IPPFAX Operation Attribute Semantics**

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

325 **4.1 printer-uri (uri) operation attribute**

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

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

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

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

340 **4.2 version-number parameter**

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

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

346

347 **4.3 ippfax-version (type2 keyword) operation attribute**

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

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

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

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

361 **5 IPPFAX Printer Description Attributes**

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

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

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

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

370

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

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

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

375 **5.1 printer-uri-supported (1setOf uri)**

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

380 **5.2 ipp-versions-supported (1setOf type2 keyword)**

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

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

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

391

392 **5.3 ippfax-versions-supported (1setOf type2 keyword)**

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

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

400 Standard keyword values are:

401 ‘1.0’: Meets the conformance requirements of IPPFAX 1/0 as specified in this document.
402

403 **5.4 operations-supported (1setOf type2 enum)**

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

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

411 A receiver MUST only support the following operations:

412 • get-printer-attributes

413 • print-job

414 • cancel-job

415 • get-jobs

416 • get-job-attributes

417 A receiver MUST NOT support any other operation.

418 **5.5 document-format-supported (1setOf mimeType)**

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

422 **5.6 document-format-version-supported (1setOf text(127))**

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

427 **5.7 digital-signatures-supported (1setOf type2 keyword)**

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

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

432 **5.8 pdl-override-supported (type2 keyword)**

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

437 **6 IPPFax Job Description Attributes**

438 This section defines the IPPFAX Printer Description attributes and the IPP Printer Description attributes
439 whose semantics are augmented for IPPFAX or are new to IPPFax. .

440 **Table 2 - Summary of Job Description attributes**

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

441 * Sender supplies as an operation attribute in a Print-Job operation.

442 **6.1 sending-user-vcard (text(MAX))**

443 This Job Description attribute identifies the Sending User in MIME vCard v3.0 [RFC2426, RFC2425]
 444 format (See Appendix B for a sample vCard). The Receiver MUST support this job description attribute
 445 according to the vCard v3.0 specification and MUST populate it with the value of the corresponding Print-
 446 Job operation attribute. The Receiver MUST support MAX (1023) octets of text. However, the Receiver
 447 MAY ignore any image, logo, and sound parts of the vCard, in which case it MUST still accept the Print-
 448 Job request and return the 'successful-ok-ignored-or-substituted-attributes' status code (see [RFC2911]
 449 section 13.1.2.2). The Receiver MAY choose to use this information on a job start and end sheet (banner
 450 page) for the job.

451 **6.2 receiving-user-vcard (text(MAX))**

452 This Job Description attribute identifies the intended Receiving User in MIME vCard v3.0 [RFC2426,
 453 RFC2425] format (See Appendix B for a sample vCard). The Receiver MUST support this Job
 454 Description operation attribute and MUST populate it with the value of the corresponding Print-Job
 455 operation attribute. The Receiver MUST support MAX (1023) octets of text. However, the Receiver
 456 MAY ignore any image, logo, and sound parts of the vCard, in which case it MUST still accept the Print-
 457 Job request and return the 'successful-ok-ignored-or-substituted-attributes' status code (see [RFC2911]
 458 section 13.1.2.2). The Receiver MAY choose to use this information on a job start and end sheet (banner
 459 page) for the job.

460 **7 Submission using Print-Job**

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

465 **7.1 IPP/1.1 Print-Job operation attributes**

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

469 **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 ¹	MUST
document-name (name(MAX)) *		MAY	MUST
compression (type3 keyword) *		MAY	MUST
document-format (mimeMediaType) *	7.1.2	MUST ²	MUST
document-format-version (type2 keyword)	7.1.3	MUST ³	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 ³	MUST
receiving-user-vcard (text(MAX))	6.2	SHOULD ³	MUST
sender-uri (name(MAX))	1	MUST ³	MUST

470 * As in IPP/1.1, these attributes are NOT Job Description attributes, only Operation attributes.
 471

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

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

³ These attributes were not defined in [RFC2911].

472 **7.1.1 ipp-attribute-fidelity operation attribute**

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

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

482 **7.1.2 document-format (mimeMediaType) operation attribute**

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

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

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

492 **7.1.3 document-format-version (type2 keyword) operation attribute**

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

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

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

500 If the Sender supplies a value that the Receiver does not support, i.e., not a value of the Receiver's
501 "document-format-versions-supported" Printer Description attribute, the Receiver MUST reject the
502 operation and return the 'client-error-document-format-not-supported' status code.

503 Standard keyword values are defined in section 5.6.

504 **7.2 Job Template Attributes (for Print-Job)**

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

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

510 As in IPP/1.1, if a Receiver supports the "xxx" Job Template attribute, then it MUST support the
511 corresponding "xxx-default" (if defined) and "xxx-supported" Printer attributes as well, and MAY support
512 the "xxx-ready" attribute (if defined).

513 In Table 4, if the "Sender supply" and "Receiver support" columns contain an explicit single value, the
514 Sender MAY send and the Receiver MAY support the Job Template attribute for an IPPFAX Job. When
515 supported, the Sender MUST send and the Receiver MUST support only the indicated value; that is, there
516 is only one allowed value. Each such single value has been selected as the value for the attribute that would
517 correspond to the *expected behavior* if the attribute were not supported at all. If these attributes are
518 supplied in an IPPFAX Job with any other value, the Receiver MUST reject the Print-Job operation (since
519 the value isn't supported and "ipp-attribute-fidelity" MUST be 'true').

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

525 In Table 4, if the "Sender supply" and "Receiver support" columns contain "MUST NOT", the Sender
526 MUST NOT supply and the Receiver MUST NOT support the Job Template attribute for an IPPFAX Job.
527 If these attributes are supplied in an IPPFAX Job, the Receiver MUST reject the Print-Job operation (since
528 the attribute isn't supported and "ipp-attribute-fidelity" MUST be 'true'). When querying the Receiver
529 with the Get-Printer-Attributes operation, the corresponding "xxx-default" and "xxx-supported" MUST
530 NOT be returned. Note: These are attributes which might degrade the appearance of the document or
531 provide a significantly non-FAX feature and do not have an obvious value which corresponds to the

532 behavior when the attribute is not supported at all, such as media-input-tray-check (type3 keyword |
 533 name(MAX)) or output-bin (type2 keyword | name(MAX)).

534

535

536

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 Error! Reference source not found.)		[RFC2911]
sides (type2 keyword)	MUST NOT	Administrator's choice	[RFC2911]

537 **7.2.1 media (type2 keyword | name(MAX)) Job Template**

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

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

544 At a minimum, an IPPFAX receiver MUST be able to render the sizes ‘na_letter_8.5x11in’
545 ‘iso_a4_210x297mm’ and be able to print on at least one of those two sizes. The Receiver MAY
546 scale down at most 10% (PDF/is directives may prohibit this scaling), overflow to another page, or
547 truncate. If the Receiver does truncate then it MUST notify the Receiving User. Any scaling
548 performed MUST be isomorphic.

549 PDF Crop boxes SHOULD be used when the Sender knows that the imageable region is less than the
550 media size. If the crop box is the union of the lesser size of iso_a4_210x297mm and na_letter_8.5x11in
551 minus ¼ of an inch, then the Sender can be sure that the majority of Receivers can print the complete image
552 without loss of data. However, this does mean that there is the possibility that data may lost.
553

554 Standard keyword values are defined in section 9.2.1.1.

555 **7.2.1.1 media-supported Job Template Printer attributes**

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

558 ‘na_letter_8.5x11in’

559 ‘iso_a4_210x297mm’

560 ‘choice_iso_a4_210x297mm_na_letter_8.5x11in’ - represents both ‘na_letter_8.5x11in’ and

561 ‘iso_a4_210x297mm’ and indicates that either is acceptable. See [jobx].

562 **7.3 Delivery Confirmation using the Print-job response**

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

567 7.4 Originator identifier image

568 The Sender MUST place an originator identifier, i.e., the value of the “sender-uri” attribute (see section 1),
569 along with the date and time, in one of the following places, DEPENDING ON IMPLEMENTATION:

- 570 1. On a cover page automatically generated by the Sender that is pre-pended before the first page
571 of user data in the PDF document.
- 572 2. Merged with the first page of the document.
- 573 3. At the top of every page of the sent Document.

574 The Sender MAY include additional data (Sending User, Receiver identity, etc.).

575 **Reference PDF/is method.**

576 8 IPPFAX operations

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

578 Section **Error! Reference source not found.** defined the semantic requirements for the Get-Printer-
579 Attributes operation, section **Error! Reference source not found.** defined the semantic requirements for
580 Validate-Job, and section 7 defined the semantic requirements for Print-Job operations for IPPFAX. This
581 section defines the IPPFAX semantics and conformance requirements for the other IPP operations.

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

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

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

591 8.1 Operation Conformance Requirements

592 Table 5 lists the conformance requirements for Printer operations for (1) an IPP/1.1 Printer (‘ipp’ URL), (2)
593 the non-privileged IPPFAX Sender, (3) an IPPFAX Receiver receiving a request from a non-privileged

594 User, and (4) an IPPFAX Receiver receiving a request from an authenticated and authorized operator or
 595 administrator, if the Receiver supports operator/administrator authentication and authorization.

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

602 **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 Error! Reference source not found., 5
Cancel-Job				
Get-Job-Attributes				

603 Legend:

604

605 Legend:

606 **MAY*** - Get-Job-Attributes restricts certain. See section 8.4.

607 **Owner** refers to the owner of the Job or Subscription object.

608 8.2 Print-Job operation

609 8.3 Cancel-Job operation

610 **Only Operators/Administrators can cancel IPPFax jobs.**

611 8.4 Get-Job-Attributes and Get-Jobs operations

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

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

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

618 job-id, job-uri
619 job-k-octets, job-k-octets-completed
620 job-media-sheets, job-media-sheets-completed,
621 time-at-creation, time-at-processing
622 job-state, job-state-reasons
623 number-of-intervening-jobs – NOT!!!!

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

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

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

632 An IPP administrator MAY read all attributes.

633 **9 Security considerations**

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

639 **9.1 Data Integrity and authentication**

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

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

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

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

647 A Receiver MUST have a TLS certificate, and the Send MUST have the public keys of the top level public
648 key Certificate Authorities (as current browsers do). If a Sender gets a public key from a Receiver that is
649 doesn't recognize, the Sender MUST resolve the unrecognized key or inform the Sending User that data
650 integrity has been lost and MUST abort the job.

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

653 **9.2 Data Privacy (encryption)**

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

655 **9.3 uri-authentication-supported (1setOf type2 keyword)**

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

658 **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

659 * TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA mandated by [RFC2246].

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

662 **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

663

664 **9.4 uri-security-supported (1setOf type2 keyword)**

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

667 **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

668

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

671 **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

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

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

674 Senders and Receivers MUST support the TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA cipher suite as
675 mandated by RFC 2246 [RFC2246]. All stronger cipher suites are OPTIONAL; weaker cipher suites
676 MUST NOT be supported or used by Senders or Receivers.

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

680 9.5 Using IPPFAX with TLS

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

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

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

- 691 IPP/1.1 sequence:
692 1. Start TCP connection
693 2. Zero or more HTTP/IPP requests
694 3. HTTP/IPP request with Upgrade to TLS header
695 4. TLS handshake
696 5. Finish the HTTP/IPP request securely
697 6. Send more HTTP/IPP requests securely ...

- 698
699 IPPFAX sequence:
700 1. Start TCP connection
701 2. Send TLS ClientHello
702 3. Rest of TLS handshake
703 4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
704 followed by the Print-Job operation).
705

706 **9.6 Access control**

707 **Needs re-writing**

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

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

715 **9.7 Reduced feature set**

716 **Needs re-writing**

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

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

723 the Receiver MUST return the ‘client-error-not-authorized’ error status code, unless the Sender is
724 authenticated as the system administrator and the Receiver supports such access.

725 **10 Attribute Syntaxes**

726 No new attribute syntaxes are defined.

727 **11 Status codes**

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

729 .

730 **12 Conformance Requirements**

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

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

- 734 1. A Sender and Receiver MUST observe the attribute name space conventions specified in section
735 **Error! Reference source not found..**
- 736 2. The Sender MUST supply and the Receiver MUST support (1) the “printer-uri” operation attribute
737 with the ‘ippfax’ scheme, (2) the “version-number” parameter with the IPP/1.1 ‘1.1’ (or higher
738 minor version) value, and (3) the “ippfax-version” operation attribute with the IPPFAX/1.0 ‘1.0’
739 keyword value in all operations to get the IPPFAX semantics as described in section 4.
- 740 3. The Receiver MUST support the Get-Printer-Attributes operation as described in sections **Error!**
741 **Reference source not found..**
- 742 4. The Receiver MUST support the Printer Description attributes as specified in section 5.
- 743 **5. The Sender MUST validate that the target Printer is IPPFAX-capable using the Get-Printer-**
744 **Attributes operation and validate that the Receiver supports the job using the Validate-Job operation**
745 **as specified in section Error! Reference source not found..**
- 746 6. The Sender MUST supply and the Receiver MUST support the operation/Job Description attributes
747 for Identify Exchange as described in section **Error! Reference source not found..**

- 748 7. The Sender MUST support submitting and the Receiver MUST accept IPPFAX Jobs as defined in
749 section 7.
- 750 8. The Sender MUST place the Sender's identity in the document according to section **Error!**
751 **Reference source not found.**
- 752 9. The Sender and Receiver MUST support the operations as indicated in section 8.
- 753 10. The Sender and Receiver MUST support the security mechanisms indicated in section 9, including
754 TLS.
- 755 The [set-ops], enable-printer and disable-printer operations MUST only be preformed on a connection that
756 has been authenticated by TLS and the user has the rights to perform them.

757 **13 IPPFAX URL Scheme**

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

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

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

762 **13.1 IPPFAX URL Scheme Applicability and Intended Usage**

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

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

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

771 **13.2 IPPFAX URL Scheme Associated IPPFAX Port**

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

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

775 **13.3 IPPFAX URL Scheme Associated MIME Type**

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

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

780 **13.4 IPPFAX URL Scheme Character Encoding**

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

787 **13.5 IPPFAX URL Scheme Syntax in ABNF**

788 The IPP protocol places a limit of 1023 octets (NOT characters) on the length of a URI (see section 4.1.5
789 ‘uri’ in [RFC2911]). An IPPFAX Receiver MUST return ‘client-error-request-value-too-long’ (see section
790 13.1.4.10 in [RFC2911]) when a URI received in a request is too long.

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

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

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

```
799   ippfax_URL = "ippfax:" "//" host [ ":" port ] [ abs_path [ "?" query ] ]
800
```

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

803 Notification Recipient listening for HTTP connections on that port of that host, and the Request-URI for
 804 the identified resource is 'abs_path'.

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

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

810 13.6 IPPFAX URL Examples

811 The following are examples of valid IPPFAX URLs for Notification Recipient objects (using DNS host
 812 names):

```
813     ippfax://abc.com
814     ippfax://abc.com/listener
815
```

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

817 The following literal IPv4 addresses:

```
818     192.9.5.5           ; IPv4 address in IPv4 style
819     186.7.8.9          ; IPv4 address in IPv4 style
820
```

821 are represented in the following example IPPFAX URLs:

```
822     ippfax://192.9.5.5/listener
823     ippfax://186.7.8.9/listeners/tom
824
```

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

```
826     ::192.9.5.5        ; IPv4 address in IPv6 style
827     ::FFFF:129.144.52.38 ; IPv4 address in IPv6 style
828     2010:836B:4179::836B:4179 ; IPv6 address per RFC 2373
829
```

830 are represented in the following example IPPFAX URLs:

```
831     ippfax://[::192.9.5.5]/listener
832     ippfax://[::FFFF:129.144.52.38]/listener
833     ippfax://[2010:836B:4179::836B:4179]/listeners/tom
834
```

835 13.7 IPPFAX URL Comparisons

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

- 838 • A port that is empty or not given MUST be treated as equivalent to the port as defined in section
839 13.2 for that IPPFAX URL;

840 14 IANA Considerations

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

843 Operation Attributes:

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

845

846 Operation/Job Description attributes:

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

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

849 sender-uri (uri) IEEE-ISTO 510n.y 1

850

851 Printer Description Attributes:

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

853 15 References

854 15.1 Normative

855 [IANA-MT]

856 IANA Registry of Media Types: <ftp://ftp.iana.org/isi.edu/in-notes/iana/assignments/media-types/>.

857 [IANA-PORTREG]

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

859 [PWG5102.3-2004]

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

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

862

863 [jobx]

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

865 ftp://ftp.pwg.org/pub/pwg/ipp/new_JOBX/wd-ippjobx10-20030518.pdf, work in progress.

866

867 **15.2 Informative**

868

869 [ifx-req]

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

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

872

873

874 [RFC2542]

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

876 [RFC3380]

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

879 [RFC 3382]

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

882 [ipp-get-method]

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

885 [ipp-iig-bis]

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

889 [RFC 3381]

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

892 [ipp-ntfy]

893 Isaacson, S., Martin, J., deBry, R., Hastings, T., Shepherd, M., Bergman, R., "Internet Printing
894 Protocol/1.1: IPP Event Notification Specification", <draft-ietf-ipp-not-spec-08.txt>, November 19,
895 2001.

- 896 [ipp-output-bin]
897 Hastings, T., and R. Bergman, “Internet Printing Protocol (IPP): output-bin attribute extension”,
898 IEEE-ISTO 5100.2-2001, February 7, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.2.pdf>.
- 899 [ipp-prod-print]
900 Ocke, K., Hastings, T., “Internet Printing Protocol (IPP): Production Printing Attributes - Set1”,
901 IEEE-ISTO 5100.3-2001, February 12, 2001, <ftp://ftp.pwg.org/pub/pwg/standards/pwg5100.3.pdf>.
- 902 [ipp-set-ops]
903 Hastings, Herriot, Kugler, and Lewis, “Job and Printer Set Operations”, <draft-ietf-ipp-job-printer-
904 set-ops-05.txt>, August 28, 2001.
- 905 [ipp-uri-scheme]
906 Herriot, McDonald, “IPP URL Scheme”, <draft-ietf-ipp-url-scheme-03.txt>, April 3, 2001.
- 907 [pwg-media]
908 Bergman, Hastings, “Media Standardized Names”, work in progress, when approved:
909 <ftp://ftp.pwg.org/pub/pwg/standards/pwg5101.1.pdf>; current draft:
910 <ftp://ftp.pwg.org/pub/pwg/media-sizes/pwg-media-12.pdf>, September 24, 2001.
- 911 [RFC1900]
912 B. Carpenter, Y. Rekhter. Renumbering Needs Work, RFC 1900, February 1996.
- 913 [RFC2069]
914 Franks, Hallam-Baker, Hostetler, Leach, Luotonen,, Sink, Stewart, “An Extension to HTTP: Digest
915 Access Authentication”, RFC2069.
- 916 [RFC2119]
917 Bradner, S., “Key words for use in RFCs to Indicate Requirement Level”, RFC2119.
- 918 [RFC2246]
919 Dierks, Allen “The TLS Protocol Version 1.0”, RFC 2246.
- 920 [RFC2305]
921 Toyoda, Ohno, Murai, Wing “A Simple Mode of Facsimile Using Internet Mail”, RFC2305.
- 922 [RFC2373]
923 R. Hinden, S. Deering. IP Version 6 Addressing Architecture, RFC 2373, July 1998.
- 924 [RFC2396]
925 Berners-Lee, T. et al. Uniform Resource Identifiers (URI): Generic Syntax, RFC 2396, August
926 1998.

- 927 [RFC2409]
928 Harkins, D., and D. Carrel, "The Internet Key Exchange (IKE)", RFC 2409, November 1998.
- 929 [RFC2425]
930 T. Howes, M. Smith, F. Dawson, "A MIME Content-Type for Directory Information", RFC 2425,
931 September 1998.
- 932 [RFC2426]
933 Dawson, Howes, "vCard MIME Directory Profile", RFC 2426, September 1998 [version v3.0].
- 934 [RFC2532]
935 Masinter, Wing, "Extended Facsimile Using Internet Mail", RFC2532.
- 936 [RFC2616]
937 R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, "Hypertext
938 Transfer Protocol - HTTP/1.1", RFC 2616, June 1999.
- 939 [RFC2617]
940 J. Franks, P. Hallam-Baker, J. Hostetler, S. Lawrence, P. Leach, A. Luotonen, L. Stewart, "HTTP
941 Authentication: Basic and Digest Access Authentication", RFC 2617, June 1999.
- 942 [RFC2732]
943 R. Hinden, B. Carpenter, L. Masinter. Format for Literal IPv6 Addresses in URL's, RFC 2732,
944 December 1999.
- 945 [RFC2818]
946 E. Rescorla, "HTTP Over TLS", May 2000.
- 947 [RFC2910]
948 Herriot, Butler, Moore, Turner, Wenn, "Internet Printing Protocol/1.1: Encoding and Transport",
949 RFC2910, September 2000.
- 950 [RFC2911]
951 deBry, Hastings, Herriot, Isaacson, Powell, "Internet Printing Protocol/1.1: Model and Semantics",
952 RFC2911, September 2000.
- 953 [RFC3196]
954 Hastings, T., Manros, C., Zehler, P., Kugler, C., and H. Holst, "Internet Printing Protocol/1.1:
955 Implementer's Guide", RFC 3196, November, 2001.
- 956 [X509]
957 CCITT. Recommendation X.509: "The Directory - Authentication Framework", 1988.

958 **16 Authors' addresses**

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

959
960
961
962
963
964
965
966
967

Contact Information:

IPPFAX Web Page: <http://www.pwg.org/qualdocs/>
IPPFAX Mailing List: ifx@pwg.org

To subscribe to the IPPFAX mailing list, send the following email:
1) send it to majordomo@pwg.org
2) leave the subject line blank

968 3) put the following two lines in the message body:
 969 subscribe ifx
 970 end

971
 972 Implementers of this specification document are encouraged to join the IPPFAX Mailing List in order
 973 to participate in any discussions of clarification issues and review of registration proposals for
 974 additional attributes and values. In order to reduce spam the mailing list rejects mail from non-
 975 subscribers, so you must subscribe to the mailing list in order to send a question or comment to the
 976 mailing list.

977
 978 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 - Neteon	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	

979
 980 1. Appendix A:

981 **17 Appendix B: vCard Example**982 **Update the example**

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

```

984 BEGIN:VCARD
985 VERSION:3.0
986 N:Moore;Paul
987 FN:Paul Moore
988 ORG:Netreon
989 TEL;CELL;VOICE:1+206-251-7008
990 ADR;WORK;;;10900 NE 8th St,Bellvue;WA;98004;United States of America
991 EMAIL;PREF;INTERNET:pmoore@netreon.com
992 REV:19991207T215341Z
993 END:VCARD
994
995

```

996 **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 Pulara, 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.

997

998 **Allow Cancel-job for Administrators.**