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

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12 **Version 1.0**
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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-ifx10-20040324.pdf, .doc

30 A version showing the changes from the previous version is available at: wd-ifx10-20040324-rev.pdf

31 The latest version of this specification is available at: ftp://pwg.org/pub/pwg/QUALDOCS/wd-ifx10-latest.pdf, .doc

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95 # **Contents**

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1 Introduction

175

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.

1.1 Operations Supported

203

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. Get-Jobs – Receivers MUST support this operation but only for authenticated Administrators
217   or Operators.

218   5. Job-Cancel – Receivers MUST support this operation but only for authenticated Administrators
219   or Operators.

220   All IPPFax Senders and Receivers MUST NOT support any other IPP operations including job
221   operations and administrative operation.

222   **1.2 Typical exchange**

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

225   1. The Sending User determines the network location of the Receiver (value of the "printer-uri"
226   operation attribute) – see section 4.1. This document does not specify how the Sending User does
227   this. Possible methods include directory lookup, search engines, business cards, network discovery
228   protocols such as SLP, etc. See Appendix E Generic Directory Schema of IPP/1.1 [RFC 2911].

229   2. The Sending User either (1) loads the Document into the Sender or (2) causes the Sender to
230   generate the Document data by means outside the scope of this document, indicates the Receiver's
231   network location and starts the exchange.

232   3. The Sender MAY determine other PDF versions supported by the Receiver and the Sender MAY
233   discover "media-supported" and "media-ready".

234   4. The Sender converts the document, if necessary, into PDF/is or another PDF subset depending on
235   the Receiver's capabilities. The PDF/is data format is described in detail in the "PDF Image-
236   Streamable (PDF/is)" specification [PWG5102.3-2004].

237 5. The Sender submits the document in a Print-Job request to the Receiver. The Sender SHOULD
238   include the sending user vCard[RFC2426, RFC2425] and receiving user vCard in the Print-Job
239   operations.

240 6. The Receiver returns a Print-Job response to the Sender. The Sender in turn MUST inform the
241   Sending-User.

242 7. The Sender MUST use Get-Job-Attributes to check for successful job completion unless the
243   Sending User requests otherwise.

244 2 Terminology

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

246 2.1 Conformance Terminology

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

254 2.2 Other Terminology

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

257 **IPP Protocol** The protocol defined in [RFC2911] and [RFC2910] and any IPP Protocol Extension
258 document (see section 14). For the IPP/1.1 Protocol each operation request must use the 'ipp' URL
259 scheme.

260 **IPPFAX Protocol** The protocol defined in this or a future revision document and any future extension
261 document. For the IPPFAX Protocol each operation request MUST use the 'ippfax' URL scheme (see
262 section 4.1 and 12). Unless a specific version number is appended to "IPPFAX", such as "IPPFAX/1.0",
263 the term IPPFAX applies to all versions.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3 IPPFAX Model

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

3.1 Printer Object Relationships

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

3.2 A Printer object with multiple URLs

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

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

320

321 **4 Common IPPFAX Operation Attribute Semantics**

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

326 **4.1 printer-uri (uri) operation attribute**

327 This operation attribute specifies the transfer path to the Receiver for the operation. As in IPP/1.1, the
328 client MUST supply the "printer-uri" operation attribute in every IPPFAX request (see [RFC2911] section
329 3.1.5). For IPPFAX, the attribute value MUST be a URL using the 'ippfax' scheme (see section 12)
330 specifying the Receiver's network location.

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

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

334 As in IPP/1.1 [RFC2911] for each operation, the Receiver NEED NOT validate that the "printer-uri"
335 operation attribute is present and that the value supplied by the Sender matches one of the Receiver's
336 "printer-uri-supported" Printer Description attribute (see section 5.1). For URI matching rules see section
337 12.7. If the Receiver does validate the "printer-uri" operation attribute and the URI value supplied does not
338 match any value of the Receiver's "printer-uri-supported" Printer Description attribute, the Receiver
339 MUST reject the request, return the 'client-error-attributes-or-values-not-supported' status code, and return
340 the attribute and value in the Unsupported Attributes Group.

341 **4.2 version-number parameter**

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

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

347

348   **4.3 ippfax-version (type2 keyword) operation attribute**

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

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

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

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

362   **5 IPPFAX Printer Description Attributes**

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

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

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

369   See section 7.2.5 for the Receiver conformance requirements for the "xxx-supported", "xxx-default", and
370   "xxx-ready" Job Template Printer attributes.

371 **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 mimeMediaType) *	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

372 * These IPP/1.1 attributes are defined in [RFC2911], but have enhanced semantics defined in this
373   document.
374 ** These IPP attributes are defined in [PWG 5100.7], but have enhanced or constrained semantics defined
375   in this document.

376 **5.1 printer-uri-supported (1setOf uri)**

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

381 **5.2 ipp-versions-supported (1setOf type2 keyword)**

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

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

390 '1.1': The IPPFAX operations meets encoding conformance requirements of IPP version 1/1 as specified
391   in [RFC2911] and [RFC2910].
392

393   **5.3 ippfax-versions-supported (1setOf type2 keyword)**

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

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

401   Standard keyword values are:

402   '1.0': Meets the conformance requirements of IPPFAX 1/0 as specified in this document.
403

404   **5.4 operations-supported (1setOf type2 enum)**

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

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

412   A receiver MUST only support the following operations:

413   •   get-printer-attributes

414   •   print-job

415   •   cancel-job

416   •   get-jobs

417   •   get-job-attributes

418   A receiver MUST NOT support any other operation.

419 **5.5 document-format-supported (1setOf mimeMediaType)**

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

423 **5.6 document-format-version-supported (1setOf text(127))**

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

428 **5.7 digital-signatures-supported (1setOf type2 keyword)**

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

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

433 **5.8 pdl-override-supported (type2 keyword)**

434 This attribute (see [RFC 2911] section 4.4.28) identifies Receiver implementation support for overriding
435 document data instructions with IPPFax job attributes. A Receiver MUST support this printer subscription
436 attribute with the value 'attempted'. . A Receiver MUST attempt to override at least the media attribute.
437

438 **6 IPPFax Job Description Attributes**

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

441   **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

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

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

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

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

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

7 IPPFAX operations

462 An IPPFax Receiver implementation MUST support the Get-Printer Attributes, Print Job, Get-Job
463 Attributes, Get-Jobs and Cancel-Job as defined in this section. An IPPFax Receiver MUST NOT support
464 any other IPP operations.

465 An IPPFax Receiver MUST NOT support any optional job-template attributes features of IPP unless
466 explicitly stated in this document. An IPPFax Receiver MAY support any optional operation attributes in
467 the Print-Job operation and MAY support Job-Description attributes in Job Objects.

468 **7.1 Get-Printer Attributes operation**

469 The Sender and Receiver MUST support the discovery of receiver capabilities using the Get-Printer
470 attributes operation.

471 See Section 5 IPPFAX Printer Description Attributes for required Printer Description Attributes for IPPFax
472 Receivers.

473 **7.2 Print-Job operation**

474 The Sender and Receiver MUST support creating IPPFAX Jobs using the Print-Job operation. The Sender
475 and Receiver MUST NOT support print by reference, i.e., MUST NOT support any other print operation,
476 i.e. Create-Job, Send-Document, Print-URI and Send-URI operations.

477 Table 3 lists the operation attributes for Print-Job operations for Senders, and Receivers. The Receiver
478 MUST NOT support operations attributes defined in other IPP extension documents.

479 **Table 3 - 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) *	7.2.1	MUST with 'true' value[1]	MUST
document-name (name(MAX)) *		MAY	MUST
compression (type3 keyword) *		MAY	MUST
document-format (mimeMediaType) *	7.2.2	MUST[2]	MUST
document-format-version (type2 keyword)	7.2.3	MUST[3]	MUST
document-natural-language (naturalLanguage) *	7.2.4	MAY	MUST
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	SHOULD[3]	MUST
receiving-user-vcard (text(MAX))	6.2	SHOULD[3]	MUST

480 ==* These IPPFax attributes are NOT Job Description attributes, only Operation attributes. – needs to be==
481   ==revised==

482

483

484

7.2.1 ipp-attribute-fidelity operation attribute

486 This operation attribute (see [RFC2911] section 3.2.1.1) indicates whether or not the client requires the
487 Printer to support all Job Template attributes and values supplied. The Sender MUST supply this operation
488 attribute in the Print-Job operations and the value MUST be 'true'. A Receiver MUST validate and support

---

[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].

This is an unapproved IEEE-ISTO PWG Working Draft Standard, subject to change.

489 this operation attribute. Note: [RFC2911] does not REQUIRE the IPP Client to supply this operation
490 attribute and allows the client to supply the 'false' value.

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

495 7.2.2 document-format (mimeMediaType) operation attribute

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

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

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

505 7.2.3 document-format-version (type2 keyword) operation attribute

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

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

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

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

516 Standard keyword values are defined in section 5.6.

517   **7.2.4 document-natural-language (naturalLanguage) operation attribute**

518   **7.2.5 Job Template Attributes (for Print-Job)**

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

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

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

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

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

539   In Table 4, if the "Sender supply" and "Receiver support" columns contain "MUST NOT", the Sender
540   MUST NOT supply and the Receiver MUST NOT support the Job Template attribute for an IPPFAX Job.
541   If these attributes are supplied in an IPPFAX Job, the Receiver MUST reject the Print-Job operation (since
542   the attribute isn't supported and "ipp-attribute-fidelity" MUST be 'true'). When querying the Receiver
543   with the Get-Printer-Attributes operation, the corresponding "xxx-default" and "xxx-supported" MUST
544   NOT be returned. Note: These are attributes which might degrade the appearance of the document or
545   provide a significantly non-FAX feature and do not have an obvious value which corresponds to the
546   behavior when the attribute is not supported at all, such as media-input-tray-check (type3 keyword |
547   name(MAX)) or output-bin (type2 keyword | name(MAX)).

548

549

550   **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 7.2.5.1)		[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]

551   **7.2.5.1 media (type2 keyword | name(MAX)) Job Template**

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

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

558   At a minimum, an IPPFAX receiver MUST be able to render the sizes 'na_letter_8.5x11in'
559   'iso_a4_210x297mm' and be able to print on at least one of those two sizes. The Receiver MAY
560   scale down at most 10% (PDF/is directives may prohibit this scaling), overflow to another page, or
561   truncate. If the Receiver does truncate then it MUST notify the Receiving User. Any scaling
562   performed MUST be isomorphic.
563   PDF Crop boxes SHOULD be used when the Sender knows that the imageable region is less than the
564   media size. If the crop box is the union of the lesser size of iso_a4_210x297mm and na_letter_8.5x11in
565   minus ¼ of an inch, then the Sender can be sure that the majority of Receivers can print the complete image
566   without loss of data. However, this does mean that there is the possibility that data may lost.
567

568   Standard keyword values are defined in section 9.2.1.1.

569   **7.2.5.2 media-supported Job Template Printer attributes**

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

572   'na_letter_8.5x11in'
573   'iso_a4_210x297mm'
574   'choice_iso_a4_210x297mm_na_letter_8.5x11in' - represents both 'na_letter_8.5x11in' and
575   'iso_a4_210x297mm' and indicates that either is acceptable. See [jobx].

576   **7.2.6 Delivery Confirmation using the Print-job response**

577   The Sender knows when the Receiver has successfully received the entire Document when the Receiver
578   returns the 'successful-ok' status code in the Print-Job Response. The Sender MUST then inform the
579   Sending User by means outside the scope of this standard that the document has successfully been
580   received, unless the Sending User requests otherwise.

581   **7.2.7 Originator identifier image**

582   Consistent with ITU-T T.30 facsimile,the Document Originator or Sender MUST place an originator
583   identifier in one of the following places, DEPENDING ON IMPLEMENTATION:

584   1. On a cover page automatically generated by the Sender that is pre-pended before the first page
585   of user data in the PDF document.

586   2.   Merged with the first page of the document.

587   3.   At the top of every page of the sent Document.

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

589   Reference PDF/is method.

590   7.3 Cancel-Job operation

591   Only Operators/Administrators can cancel IPPFax jobs.

592   7.4 Get-Job-Attributes

593   7.5 Get-Jobs

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

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

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

600   job-id, job-uri
601   job-k-octets, job-k-octets-completed
602   job-media-sheets, job-media-sheets-completed,
603   time-at-creation, time-at-processing
604   job-state, job-state-reasons
605   number-of-intervening-jobs – NOT!!!!!
606
607   The exact choice of Job attributes that a client can query for IPPFAX Jobs, including not returning any,
608   DEPENDS ON IMPLEMENTATION and the security policy in force and is outside the scope of this
609   standard (as in IPP/1.1).

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

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

614 An IPP administrator MAY read all attributes.

8 Security considerations

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

8.1 Data Integrity and authentication

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

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

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

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

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

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

8.2 Data Privacy (encryption)

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

637 **8.3 uri-authentication-supported (1setOf type2 keyword)**

638 This attribute (see [RFC2911] section 4.4.2) identifies the Client Authentication mechanism associated
639 with each URI listed in the "printer-uri-supported" attribute (see section 5.1).

640 **Table 5 - 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

641 * TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA mandated by [RFC2246].

642 Table 6 compares the Digest Authentication requirements for IPP/1.1 clients, IPP/1.1 Printers, IPPFAX
643 Senders, and IPPFAX Receivers.

644 **Table 6 - 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

645

8.4 uri-security-supported (1setOf type2 keyword)

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

649 **Table 7 - 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

650

651   Table 8 compares the TLS conformance requirements for IPP/1.1 clients, IPP/1.1 Printers, IPPFAX
652   Senders, and IPPFAX Receivers.

653   **Table 8 - 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

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

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

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

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

662   **8.5 Using IPPFAX with TLS**

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

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

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

673   IPP/1.1 sequence:
674   1. Start TCP connection
675   2. Zero or more HTTP/IPP requests
676   3. HTTP/IPP request with Upgrade to TLS header
677   4. TLS handshake
678   5. Finish the HTTP/IPP request securely
679   6. Send more HTTP/IPP requests securely ...
680
681   IPPFAX sequence:
682   1. Start TCP connection
683   2. Send TLS ClientHello
684   3. Rest of TLS handshake
685   4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
686   followed by the Print-Job operation).
687

8.6 Access control

689   <mark>Needs re-writting</mark>

690   It is expected that the majority of IPPFAX Receivers will operate in a public mode when operating on the
691   Internet, so that anonymous users can send documents without requiring client authentication
692   (corresponding to the 'none' value for the "uri-authentication-supported" attribute - see section 8.3).
693   However a Receiver MAY protect itself using any Client Authentication method specified in [RFC2911]
694   (digest authentication [RFC2069] for example) to restrict access to any or all of its functionality.

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

8.7 Reduced feature set

698   <mark>Needs re-writting</mark>

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

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

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

9 Attribute Syntaxes

708 No new attribute syntaxes are defined.

10 Status codes

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

711

11 Conformance Requirements

713 Need to be re-worked.

11.1 Operation Conformance Requirements

715 **Error! Reference source not found.** lists the conformance requirements for Printer operations for (1) an
716 IPP/1.1 Printer ('ipp' URL), (2) the non-privileged IPPFAX Sender, (3) an IPPFAX Receiver receiving a
717 request from a non-privileged User, and (4) an IPPFAX Receiver receiving a request from an authenticated
718 and authorized operator or administrator, if the Receiver supports operator/administrator authentication and
719 authorization.

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

726 **Table 9 - 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 7.4
Get-Printer-Attributes	MUST	MUST	MUST	sections **Error! Reference source not found.**, 5
Cancel-Job				
Get-Job-Attributes				

727 Legend:
728

729 Legend:
730   **MAY*** - Get-Job-Attributes restricts certain. See section 7.4.
731   **Owner** refers to the owner of the Job or Subscription object.
732

733

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

736   1. A Sender and Receiver MUST observe the attribute name space conventions specified in section
737   **Error! Reference source not found.**.

738   2. The Sender MUST supply and the Receiver MUST support (1) the "printer-uri" operation attribute
739   with the 'ippfax' scheme, (2) the "version-number" parameter with the IPP/1.1 '1.1' (or higher
740   minor version) value, and (3) the "ippfax-version" operation attribute with the IPPFAX/1.0 '1.0'
741   keyword value in all operations to get the IPPFAX semantics as described in section 4.

742   3. The Receiver MUST support the Get-Printer-Attributes operation as described in sections **Error!**
743   **Reference source not found.**.

744   4. The Receiver MUST support the Printer Description attributes as specified in section 5.

745   5. ==The Sender MUST validate that the target Printer is IPPFAX-capable using the Get-Printer-==
746   ==Attributes operation and validate that the Receiver supports the job using the Validate-Job operation==
747   ==as specified in section **Error! Reference source not found.**.==

748   6. The Sender MUST supply and the Receiver MUST support the operation/Job Description attributes
749   for Identify Exchange as described in section **Error! Reference source not found.**.

750   7. The Sender MUST support submitting and the Receiver MUST accept IPPFAX Jobs as defined in
751   section 1.

752   8. The Sender MUST place the Sender's identity in the document according to section **Error!**
753   **Reference source not found.**.

754   9. The Sender and Receiver MUST support the operations as indicated in section 7.

755   10. The Sender and Receiver MUST support the security mechanisms indicated in section 8, including
756   TLS.

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

759 12 IPPFAX URL Scheme

760 ==Need to be re-worked to be consistent RFC 3510==

761 ==Need to register a port with IANA for IPPFax.==

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

764 12.1 IPPFAX URL Scheme Applicability and Intended Usage

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

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

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

12.2 IPPFAX URL Scheme Associated IPPFAX Port

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

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

12.3 IPPFAX URL Scheme Associated MIME Type

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

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

12.4 IPPFAX URL Scheme Character Encoding

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

12.5 IPPFAX URL Scheme Syntax in ABNF

790   The IPP protocol places a limit of 1023 octets (NOT characters) on the length of a URI (see section 4.1.5
791   'uri' in [RFC2911]). An IPPFAX Receiver MUST return 'client-error-request-value-too-long' (see section
792   13.1.4.10 in [RFC2911]) when a URI received in a request is too long.

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

795   IPPFAX URLs MUST be represented in absolute form. Absolute URLs always begin with a scheme name
796   followed by a colon. For definitive information on URL syntax and semantics, see "Uniform Resource
797   Identifiers (URI): Generic Syntax and Semantics" [RFC2396]. This specification adopts the definitions of

798 "port", "host", "abs_path", and "query" from [RFC2396], as updated by [RFC2732] and [RFC2373] (for
799 IPv6 addresses in URLs).

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

801   **ippfax_URL = "ippfax:" "//" host [":" port] [abs_path ["?" query]]**
802

803 If the port is empty or not given, the IANA-assigned port as defined in section 12.2 is assumed. The
804 semantics are that the identified resource (see section 5.1.2 of [RFC2616]) is located at the IPPFAX
805 Notification Recipient listening for HTTP connections on that port of that host, and the Request-URI for
806 the identified resource is 'abs_path'.

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

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

812 **12.6 IPPFAX URL Examples**

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

815   ippfax://abc.com
816   ippfax://abc.com/listener
817
818 Note: The use of IP addresses in URLs SHOULD be avoided whenever possible (see [RFC1900]).

819 The following literal IPv4 addresses:

820   192.9.5.5   ; IPv4 address in IPv4 style
821   186.7.8.9   ; IPv4 address in IPv4 style
822
823 are represented in the following example IPPFAX URLs:

824   ippfax://192.9.5.5/listener
825   ippfax://186.7.8.9/listeners/tom
826
827 The following literal IPv6 addresses (conformant to [RFC2373]):

828   ::192.9.5.5   ; IPv4 address in IPv6 style
829   ::FFFF:129.144.52.38   ; IPv4 address in IPv6 style

```
830        2010:836B:4179::836B:4179    ; IPv6 address per RFC 2373
831
```

832 are represented in the following example IPPFAX URLs:

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

12.7 IPPFAX URL Comparisons

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

840   • A port that is empty or not given MUST be treated as equivalent to the port as defined in section
841   12.2 for that IPPFAX URL;

13 IANA Considerations

843 IANA shall register the ippfax URL scheme as defined in section 12 according to the procedures of
844 [RFC2717] and assign a well known port.

```
845 Operation Attributes:
846 ippfax-version (type2 keyword)              IEEE-ISTO 510n.y 4.3
847
848 Operation/Job Description attributes:
849 sending-user-vcard (text(MAX))             IEEE-ISTO 510n.y 6.1
850 receiving-user-vcard (text(MAX))           IEEE-ISTO 510n.y 6.2
851
852 Printer Description Attributes:
853 ippfax-versions-supported (1setOf type2 keyword) IEEE-ISTO 510n.y 5.3
```

14 References

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

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960
961   Contact Information:
962
963   IPPFAX Web Page: http://www.pwg.org/qualdocs/
964   IPPFAX Mailing List: ifx@pwg.org
965
966   To subscribe to the IPPFAX mailing list, send the following email:
967   1) send it to majordomo@pwg.org
968   2) leave the subject line blank
969   3) put the following two lines in the message body:
970   subscribe ifx
971   end
972
973   Implementers of this specification document are encouraged to join the IPPFAX Mailing List in order
974   to participate in any discussions of clarification issues and review of registration proposals for
975   additional attributes and values. In order to reduce spam the mailing list rejects mail from non-
976   subscribers, so you must subscribe to the mailing list in order to send a question or comment to the
977   mailing list.
978
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980
981   1. Appendix A:

16 Appendix B: vCard Example

983 <mark>Update the example</mark>

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

```
BEGIN:VCARD
VERSION:3.0
N:Moore;Paul
FN:Paul Moore
ORG:Netreon
TEL;CELL;VOICE:1+206-251-7008
ADR;WORK:;;10900 NE 8th St;Bellvue;WA;98004;United States of America
EMAIL;PREF;INTERNET:pmoore@netreon.com
REV:19991207T215341Z
END:VCARD
```

17 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

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			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 05/28/03	Dennis Carney Tom Hastings	Editorial updates 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.

998

999   <mark>Allow Cancel-job for Administrators.</mark>