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IEEE-ISTO

Printer Working Group

IPP Fax Project

Standard for IPPFAX/1.0 Protocol

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Maturity: Initial



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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.

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87 2) leave the subject line blank

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89 subscribe ifx

90 end

91

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93 discussions of clarifications or review of registration proposals for additional names.

94

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174

175 **1 Introduction**

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

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

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

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

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

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

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

203 **1.1 Operations Supported**

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

205

- 206 1. Get-Printer-Attributes - If the document-format-version is not PDF/is or the media is not
207 iso_a4_210x297mm or na_letter_8.5x11in, then the Sender MUST verify that the Receiver can
208 support the alternate attributes. Rational: Using Get-Printer-Attributes would avoid rejection of
209 the job which is important if the document data is very large.
- 210 2. Print-Job - Sender MUST submit the IPPFAX job with a single document (Create-Job, Send-
211 document and Send-URI and Print-URI MUST NOT be supported by Senders or Receivers).
- 212 3. Get-Job-Attributes - The Sender MUST support and MUST use this operation to check for
213 successful job completion unless the Sending User wishes otherwise. Job-History MUST be
214 retained by the Receiver for at least 5 minutes after job completion. See 4.3.7.2 of RFC2911 for
215 printer object Job-History discussion.
- 216 4. 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 15). 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 13). 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.

303 **3 IPPFAX Model**

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

305 **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.

311 **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 13)
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 13.7. 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 8.2.4 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 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

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 attribute 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 mimeType)**

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.

443 **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.

452 **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.

461 **7 Submission using Print-Job**

462 **8 IPPFAX operations**

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

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

469 **8.1 Get-Printer Attributes operation**

470

471 **8.2 Print-Job operation**

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

475 Table 3 lists the operation attributes for Print-Job operations for Senders, and Receivers. Any other IPP
476 operation attributes defined in other documents are OPTIONAL for IPPFAX.

477

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) *	8.2.1	MUST with 'true' value ¹	MUST
document-name (name(MAX)) *		MAY	MUST
compression (type3 keyword) *		MAY	MUST
document-format (mimeMediaType) *	8.2.2	MUST ²	MUST
document-format-version (type2 keyword)	8.2.3	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))	Error! Reference source not found.	MUST ³	MUST

478 * As in IPP/1.1, these attributes are NOT Job Description attributes, only Operation attributes.
479

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].

480 **8.2.1 ipp-attribute-fidelity operation attribute**

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

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

490 **8.2.2 document-format (mimeMediaType) operation attribute**

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

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

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

500 **8.2.3 document-format-version (type2 keyword) operation attribute**

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

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

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

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

511 Standard keyword values are defined in section 5.6.

512 **8.2.4 Job Template Attributes (for Print-Job)**

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

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

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

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

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

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

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

542

543

544

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 8.2.4.1)		[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]

545 **8.2.4.1 media (type2 keyword | name(MAX)) Job Template**

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

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

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

557 PDF Crop boxes SHOULD be used when the Sender knows that the imageable region is less than the
558 media size. If the crop box is the union of the lesser size of iso_a4_210x297mm and na_letter_8.5x11in
559 minus ¼ of an inch, then the Sender can be sure that the majority of Receivers can print the complete image
560 without loss of data. However, this does mean that there is the possibility that data may lost.
561

562 Standard keyword values are defined in section 9.2.1.1.

563 **8.2.4.2 media-supported Job Template Printer attributes**

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

566 ‘na_letter_8.5x11in’

567 ‘iso_a4_210x297mm’

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

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

570 **8.2.5 Delivery Confirmation using the Print-job response**

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

575 **8.2.6 Originator identifier image**

576 The Sender MUST place an originator identifier, i.e., the value of the “sender-uri” attribute (see section
577 **Error! Reference source not found.**), along with the date and time, in one of the following places,
578 DEPENDING ON IMPLEMENTATION:

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

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

584 **Reference PDF/is method.**

585

586

587 **8.3 Cancel-Job operation**

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

589 **8.4 Get-Job-Attributes**

590 **8.5 Get-Jobs**

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

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

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

- 597 job-id, job-uri
- 598 job-k-octets, job-k-octets-completed
- 599 job-media-sheets, job-media-sheets-completed,

600 time-at-creation, time-at-processing
601 job-state, job-state-reasons
602 **number-of-intervening-jobs – NOT!!!!**
603

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

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

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

611 An IPP administrator **MAY** read all attributes.

612 **9 Security considerations**

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

618 **9.1 Data Integrity and authentication**

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

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

622 A Sender **MAY** have a TLS certificate for client authentication. A Receiver **MAY** decide to reject
623 requests that come from Senders that do not have a TLS certificate and return the ‘client-error-not-
624 authenticated’ status code.

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

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

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

632 9.2 Data Privacy (encryption)

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

634 9.3 uri-authentication-supported (1setOf type2 keyword)

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

637 **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

638 * TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA mandated by [RFC2246].

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

641 **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

642

643 **9.4 uri-security-supported (1setOf type2 keyword)**

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

646 **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

647

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

650 **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

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

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

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

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

659 9.5 Using IPPFAX with TLS

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

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

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

670 IPP/1.1 sequence:

- 671 1. Start TCP connection
- 672 2. Zero or more HTTP/IPP requests
- 673 3. HTTP/IPP request with Upgrade to TLS header
- 674 4. TLS handshake
- 675 5. Finish the HTTP/IPP request securely
- 676 6. Send more HTTP/IPP requests securely ...

677

678 IPPFAX sequence:

- 679 1. Start TCP connection
- 680 2. Send TLS ClientHello
- 681 3. Rest of TLS handshake
- 682 4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
683 followed by the Print-Job operation).

684

685 9.6 Access control

686 Needs re-writing

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

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

694 9.7 Reduced feature set

695 Needs re-writing

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

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

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

704 **10 Attribute Syntaxes**

705 No new attribute syntaxes are defined.

706 **11 Status codes**

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

708 .

709 **12 Conformance Requirements**

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

711 **12.1 Operation Conformance Requirements**

712 lists the conformance requirements for Printer operations for (1) an IPP/1.1 Printer (‘ipp’ URL), (2) the
713 non-privileged IPPFAX Sender, (3) an IPPFAX Receiver receiving a request from a non-privileged User,
714 and (4) an IPPFAX Receiver receiving a request from an authenticated and authorized operator or
715 administrator, if the Receiver supports operator/administrator authentication and authorization.

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

722

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 8.4
Get-Printer-Attributes	MUST	MUST	MUST	sections Error! Reference source not found., 5
Cancel-Job				
Get-Job-Attributes				

723

Legend:

724

725

Legend:

726

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

727

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

728

729

730

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

731

732

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

733

734

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

735

736

737

738

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

739

740

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

- 741 5. The Sender MUST validate that the target Printer is IPPFAX-capable using the Get-Printer-
742 Attributes operation and validate that the Receiver supports the job using the Validate-Job operation
743 as specified in section **Error! Reference source not found.**
- 744 6. The Sender MUST supply and the Receiver MUST support the operation/Job Description attributes
745 for Identify Exchange as described in section **Error! Reference source not found.**
- 746 7. The Sender MUST support submitting and the Receiver MUST accept IPPFAX Jobs as defined in
747 section 7.
- 748 8. The Sender MUST place the Sender's identity in the document according to section **Error!**
749 **Reference source not found.**
- 750 9. The Sender and Receiver MUST support the operations as indicated in section 8.
- 751 10. The Sender and Receiver MUST support the security mechanisms indicated in section 9, including
752 TLS.
- 753 The [set-ops], enable-printer and disable-printer operations MUST only be performed on a connection that
754 has been authenticated by TLS and the user has the rights to perform them.

755 **13 IPPFAX URL Scheme**

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

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

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

760 **13.1 IPPFAX URL Scheme Applicability and Intended Usage**

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

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

768 The intended usage of the ‘ippfax’ URL scheme is COMMON.

769 **13.2 IPPFAX URL Scheme Associated IPPFAX Port**

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

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

773 **13.3 IPPFAX URL Scheme Associated MIME Type**

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

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

778 **13.4 IPPFAX URL Scheme Character Encoding**

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

785 **13.5 IPPFAX URL Scheme Syntax in ABNF**

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

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

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

794 “port”, “host”, “abs_path”, and “query” from [RFC2396], as updated by [RFC2732] and [RFC2373] (for
795 IPv6 addresses in URLs).

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

```
797     ippfax_URL = "ippfax:" "//" host [ ":" port ] [ abs_path [ "?" query ] ]
798
```

799 If the port is empty or not given, the IANA-assigned port as defined in section 13.2 is assumed. The
800 semantics are that the identified resource (see section 5.1.2 of [RFC2616]) is located at the IPPFAX
801 Notification Recipient listening for HTTP connections on that port of that host, and the Request-URI for
802 the identified resource is ‘abs_path’.

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

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

808 13.6 IPPFAX URL Examples

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

```
811     ippfax://abc.com
812     ippfax://abc.com/listener
813
```

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

815 The following literal IPv4 addresses:

```
816     192.9.5.5           ; IPv4 address in IPv4 style
817     186.7.8.9          ; IPv4 address in IPv4 style
818
```

819 are represented in the following example IPPFAX URLs:

```
820     ippfax://192.9.5.5/listener
821     ippfax://186.7.8.9/listeners/tom
822
```

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

```
824     ::192.9.5.5        ; IPv4 address in IPv6 style
825     ::FFFF:129.144.52.38 ; IPv4 address in IPv6 style
```

826 2010:836B:4179::836B:4179 ; IPv6 address per RFC 2373

827

828 are represented in the following example IPPFAX URLs:

829 ippfax://[::192.9.5.5]/listener

830 ippfax://[::FFFF:129.144.52.38]/listener

831 ippfax://[2010:836B:4179::836B:4179]/listeners/tom

832

833 13.7 IPPFAX URL Comparisons

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

- 836 • A port that is empty or not given MUST be treated as equivalent to the port as defined in section
837 13.2 for that IPPFAX URL;

838 14 IANA Considerations

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

841 Operation Attributes:

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

843

844 Operation/Job Description attributes:

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

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

847 sender-uri (uri) IEEE-ISTO 510n.y **Error!**

848 **Reference source not found.**

849

850 Printer Description Attributes:

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

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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
- 3) put the following two lines in the message body:
subscribe ifx
end

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

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979

1. Appendix A:

980 **17 Appendix B: vCard Example**981 **Update the example**

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

```

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

```

993

994

995 **18 Revision History (to be removed when standard is approved)**

Revision	Date	Author	Notes
1	1/16/01	Paul Moore, Netreon	Initial version
2	2/27/01	Paul Moore, Gail Songer, Netreon	Specify TLS as MUST Removed Cover page and combined device Added need for big text types

3	4/11/01	Gail Songer, Netreon	Move attribute definition to first reference
4	5/24/01	Tom Hastings	Editorially updated the document to follow the style of the IPP standard documents. Added 23 issues to be reviewed. Capitalized the special terms throughout without showing revisions in order to make the document with revisions more readable.
5	5/21/01	Tom Hastings, John Pulera, Ira McDonald	Updated from the 6/6/01 telecon agreements on most of the 23 issues. There are 20 issues remaining, mostly new.
6	7/27/01	Tom Hastings, Ira McDonald	Updated from the 6/29/01 telecon. There are 41 issues remaining, mostly new.
7	10/8/01	Tom Hastings, Ira McDonald	Updated with all the resolutions to the 41 ISSUES from the August 1, 2001 IPPFAX WG meeting in Toronto, and the subsequent telecons: August, 9, 14, and 17, 2001. There are 4 (new) issues remaining.
8	11/17/01	Tom Hastings	Updated with the agreements from the IPPFAX WG meeting, 10/24/01, Texas. See minutes. There are 5 issues remaining.
9	12/31/01	Tom Hastings	Updated with the agreements reached at the 12/14/01 telecon.
10	2/19/02	Tom Hastings	Updated with the agreements reached as the 2/5/02 IPPFAX WG meeting. There are no remaining issues.
11	9/20/02	Tom Hastings	Replaced all occurrences of UIF with PDFax and uif with PDFax.
12	10/16/02 10/24/02	Rick Seeler Gail Songer	Updated to reflect PDF/is as file format. Replace CONNEG with UPDF. Attributes for OPTIONAL PDF/is functionality.
13	11/22/02	Rick Seeler	Replaced 'PDFax' with 'PDF/is' or 'pdfis'. Updated spec to match 0.3 PDF/is specification.
14	03/18/03	Gail Songer	Removed pdfis-profile-requested and pdfis-profile-supported and pdfis-profiles; all image formats are required Removed pdfis-cache-size-k-octets (now fixed value) Removed pdfis-banding-direction-supported Started to split references into two sections, "normative" and "informative" and update descriptions to references Other editorial changes
15	03/24/03	Gail Songer	Added digital-signatures-supported.

			Added pdf-format and pdf-format supported. Put “coloring” back to optional. Removed PDF data encryption (leave for a future version of PDF/is and IPPFax)
16		Gail Songer Dennis Carney	Remove all references to coloring Changed pdf-format to document-format-version Remove the requirement that [set-ops] supports document-format coloring (we only allow document-format==PDF) ALL admin operations require TLS to have authenticated the user and the user has admin rights Other editorial changes
17	05/21/03 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.

996

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