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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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A version showing the changes from the previous version is available at: [wd-ifx10-20040414-rev.pdf](#)

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87 2) leave the subject line blank

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

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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170

171 **1 Introduction**

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

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

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

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

187 An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least PDF/is [PWG5102.3-
188 2004] which is defined for the 'application/pdf' document format MIME type. A Print System MAY be
189 configured to support both the IPPFAX and IPP protocols concurrently for a single output device (or
190 multiple output devices), but each protocol requires separate Printer objects with distinct URLs. Note - It
191 is assumed that the reader is familiar with IPP/1.1 [RFC2911], [RFC2910], [RFC3196], and [ipp-iig-bis].

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

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

199 **1.1 Required Operations and features (normative)**

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

201

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

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

218 All IPPFax Receivers MUST support receiving PFD/is version 1.0 as defined in [PWG5102.3-
219 2004].

220 All IPPFax Senders MUST support generating and transmitting PFD/is version 1.0 as defined in
221 [PWG5102.3-2004].

222

223 **1.2 Typical exchange (informative)**

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

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

- 230 2. The Sending User either (1) loads the Document into the Sender or (2) causes the Sender to
231 generate the Document data by means outside the scope of this document, indicates the Receiver's
232 network location and starts the exchange.
- 233 3. The Sender MAY determine other PDF versions supported by the Receiver and the Sender MAY
234 discover "media-supported" and "media-ready".
- 235 4. The Sender converts the document, if necessary, into PDF/is or another PDF subset depending on
236 the Receiver's capabilities. The PDF/is data format is described in detail in the "PDF Image-
237 Streamable (PDF/is)" specification [PWG5102.3-2004].
- 238 5. The Sender submits the document in a Print-Job request to the Receiver. The Sender SHOULD
239 include the sending user vCard[RFC2426, RFC2425] and receiving user vCard in the Print-Job
240 operations.
- 241 6. The Receiver returns a Print-Job response to the Sender. The Sender in turn MUST inform the
242 Sending-User.
- 243 7. The Sender MUST use Get-Job-Attributes to check for successful job completion unless the
244 Sending User requests otherwise.

245 **2 Terminology**

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

247 **2.1 Conformance Terminology**

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

255 **2.2 Other Terminology**

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

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

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

265 **Printer object (or Printer)** A hardware or software entity that accepts protocol operation requests and
266 returns protocol responses. A Printer object MAY be: (1) an IPP Printer object or (2) an IPPFAX Printer
267 object, DEPENDING ON IMPLEMENTATION (see section **Error! Reference source not found.**), but
268 MUST NOT be both (since they support some different operations and attributes and are really two
269 different kinds of Print Services). A Printer object MAY support multiple URLs with different security,
270 authentication, and/or access control (see [RFC2911] sections 4.4.1, 4.4.2, 4.4.3, and 8). However, each
271 URL for a Printer object MUST support the same operations and attributes with the same values, except as
272 restricted depending on the security, authentication, and/or access control implied by the URL. In other
273 words, each URL for a given Printer object is offering the same Print Service.

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

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

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

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

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

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

- 291 **IPP client** A client that uses the IPP Protocol to interact with an IPP Printer object.
- 292 **Sender** A client that uses the IPPFAX Protocol to query a Receiver and transmit a Document to that
293 Receiver.
- 294 **Document** The electronic representation of a set of one or more pages that the Sender sends to the
295 Receiver.
- 296 **Sending User** The person interacting with the Sender.
- 297 **Receiving User** The intended human recipient of the Document being sent by the Sender to the Receiver.
- 298 **IPP Job** A job submitted by an IPP client to an IPP Printer object using the IPP Protocol.
- 299 **IPPFAX Job** A job submitted by a Sender to a Receiver using the IPPFAX Protocol.
- 300 **PDF/is** The file format defined by [PWG5102.3-2004].
- 301 The terminology defined in [RFC2911], such as **attribute**, **operation**, **request**, **response**, **operation**
302 **attribute**, **Printer Description attribute**, **Job Description attribute**, **integrity**, and **privacy** is also used
303 in this document with the same capitalization conventions and semantics.

304 **3 IPPFAX Model**

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

306 **3.1 Printer Object Relationships**

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

312 **3.2 A Printer object with multiple URLs**

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

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

321

322 **4 Common IPPFAX Operation Attribute Semantics**

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

327 **4.1 printer-uri (uri) operation attribute**

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

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

334 `ippfax://www.acme.com/ippfax-printers/printer5`

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

342 **4.2 version-number parameter**

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

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

348

349 **4.3 ippfax-version (type2 keyword) operation attribute**

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

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

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

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

363 **5 IPPFAX Printer Description Attributes**

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

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

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

370 See section 7.2.2 for the Receiver conformance requirements for the "xxx-supported", "xxx-default", and
371 "xxx-ready" Job Template Printer attributes.

372

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

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

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

377 **5.1 printer-uri-supported (1setOf uri)**

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

382 **5.2 ipp-versions-supported (1setOf type2 keyword)**

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

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

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

393

394 **5.3 ippfax-versions-supported (1setOf type2 keyword)**

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

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

402 Standard keyword values are:

403 ‘1.0’: Meets the conformance requirements of IPPFAX 1/0 as specified in this document.
404

405 **5.4 operations-supported (1setOf type2 enum)**

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

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

413 **A receiver **MUST** only support the following operations:**

414 • **get-printer-attributes**

415 • **print-job**

416 • **cancel-job**

417 • **get-jobs**

418 • **get-job-attributes**

419 A receiver **MUST NOT** support any other operation.

420 **5.5 document-format-supported (1setOf mimeType)**

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

424 **5.6 document-format-version-supported (1setOf text(127))**

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

429 **5.7 digital-signatures-supported (1setOf type2 keyword)**

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

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

434 **5.8 pdl-override-supported (type2 keyword)**

435 This attribute (see [RFC 2911] section 4.4.28) identifies Receiver implementation support for overriding
436 document data instructions with IPPFax job attributes. A Receiver MUST support this printer subscription
437 attribute with the value 'attempted'. . A Receiver MUST attempt to override at least the media attribute.
438

439 **6 IPPFax Job Description Attributes**

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

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
compression-supplied (type3 keyword) **	MUST NOT	MUST
document-charset-supplied (charset) **	MUST NOT	MUST
document-digital-signature-supplied (type2 keyword)**	MUST NOT	MUST
document-format-details-supplied (1setOf collection) **	MUST NOT	MUST NOT
document-format-supplied (mimeMediaType)**	MUST NOT	MUST
document-format-version-supplied (text(127)) **	MUST NOT	MUST
document-message-supplied (text(MAX))**	MUST NOT	MUST NOT
document-name-supplied (name (MAX)) **	MUST NOT	MUST
document-natural-language-supplied (naturalLanguage)**	MUST NOT	MUST

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

** These IPP attributes are defined in [PWG 5100.7]

442

443

444

445

446 6.1 sending-user-vcard (text(MAX))

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

455 6.2 receiving-user-vcard (text(MAX))

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

464 **6.3 xxx-supplied attributes**

465 An IPPFax Receiver implementation MUST supported compression-supplied, document-charset-supplied,
466 document-digital-signature-supplied, document-format-supplied, document-format-version-supplied,
467 document-name-supplied, and document-natural-language-supplied Job-Description attributes as defined in
468 [PWG 5100.7]

469 An IPPFax Receiver MUST NOT implement document-format-details-supplied and document-message-
470 supplied Job-Description attributes.

471 SHOULD WE INCLUDE Job-Progress attributes job-impressions-completed, job-media-sheets-completed,
472 job-k-octets-processed from RFC 2911? Nothing from RFC3381 applies

473 **7 IPPFAX Operations**

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

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

480 **7.1 Get-Printer-Attributes**

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

483 See Section 5 IPPFAX Printer Description Attributes for required Printer Description Attributes for IPPFax
484 Receivers.

485 **7.2 Print-Job**

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

489 **7.2.1 Operation Attributes**

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

492 **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)	7.2.1.1	MUST with 'true' value ¹	MUST
document-name (name(MAX)) *	7.2.1.2	MAY	MUST
compression (type3 keyword) *		MAY	MUST
document-format (mimeType) *	7.2.1.3	MUST ²	MUST
document-format-version (type2 keyword) *	7.2.1.4	MUST ³	MUST
document-charset (charset) *	7.2.1.5	MAY	MUST
document-natural-language (naturalLanguage) *	7.2.1.6	MAY	MUST
document-digital-signature (type2 keyword)	7.2.1.7	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

493 * These IPPFax attributes MUST be copied to their corresponding xxx-supplied Job-Description attributes
 494 by the Receiver.
 495

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].

496 7.2.1.1 ipp-attribute-fidelity

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

501 If the Sender does not supply this attribute or supplies the 'false' value, the Receiver MUST reject the
502 operation, MUST return the 'client-error-bad-request' status code, and SHOULD return the 'ipp-attribute-
503 fidelity' attribute name keyword in the Unsupported Attributes Group.

504 7.2.1.2 document-name (naturalLanguage)

505 A Sender MAY supply this operation attribute. A Receiver MUST support this operation attribute. The
506 Receiver MUST copy the value of this attribute to the corresponding document-name-supplied Job
507 Description attribute. (See section 5.2.8 of [PWG5100.7])

508 7.2.1.3 document-format (mimeMediaType)

509 This operation attribute (see [RFC2911] section 3.2.1.1) identifies the MIME Media Type of the document
510 that the Sender is sending. The Sender MUST supply this operation attribute in the Print-Job operation
511 with a value of "application/PDF". A Receiver MUST validate that the value of attribute is
512 "application/pdf". The Receiver MUST copy the value of this attribute to the corresponding document-
513 format-supplied Job Description attribute. (See section 5.2.5 of [PWG5100.7])

514 If the Sender does not supply this attribute, the Receiver MUST reject the operation, MUST return the
515 'client-error-bad-request' status code, and SHOULD return the 'document-format' attribute name keyword
516 in the Unsupported Attributes Group

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

519 7.2.1.4 document-format-version (type2 keyword)

520 This operation attribute is defined in section 3.2.5.7 in [PWG5100.7].

521 This operation attribute identifies the type2 keyword of the subset of PDF. The Sender MUST supply this
522 operation attribute in the Print-Job operation to specify a subset of PDF. A Receiver MUST support and
523 validate this operation attribute. If the supplied document-format-version is not in the Receivers document-
524 format-version-supported list then the Receiver MUST reject the job with a status code "client-error-

525 document-format-not-supported". The Receiver MUST copy the value of this attribute to the corresponding
526 document-format-version-supplied Job Description attribute. (See section 5.2.6 of [PWG5100.7])

527 See section 5.6.

528 **7.2.1.5 document-charset (charset)**

529 A Sender MAY supply this operation attribute. A Receiver MUST support this operation attribute. The
530 Receiver MUST copy the value of this attribute to the corresponding document-charset-supplied Job
531 Description attribute. (See section 5.2.2 of [PWG5100.7])

532 **7.2.1.6 document-natural-language (naturalLanguage)**

533 A Sender MAY supply this operation attribute. A Receiver MUST support this operation attribute. The
534 Receiver MUST copy the value of this attribute to the corresponding document-natural-language-supplied
535 Job Description attribute. (See section 5.2.9 of [PWG5100.7])

536 **7.2.1.7 document-digital-signature (type2 keyword)**

537 A Sender MAY supply this operation attribute. A Receiver MUST support this operation attribute. The
538 Receiver MUST copy the value of this attribute to the corresponding document-digital-signature-supplied
539 Job Description attribute. (See section 5.2.3 of [PWG5100.7])

540 **7.2.2 Job Template Attributes**

541 As in [RFC2911], the term "Job Template attribute" is actually up to four attributes: the "xxx" Job
542 attribute, and the "xxx-default", "xxx-supported", and possibly the "xxx-ready" Printer attributes.

543 As in [RFC2911], if a Receiver supports the "xxx" Job Template attribute, then it MUST support the
544 corresponding "xxx-default" (if defined) and "xxx-supported" Printer attributes as well, and MAY support
545 the "xxx-ready" attribute (if defined).

546 Senders MUST supply and Receivers MUST support the Job-Template attribute except "media"[RFC2911]
547 job-template attribute section 7.2.2.1. Senders MUST NOT supply and Receivers MUST NOT support any
548 other Job-Template attributes.

549

550

Table 4 - IPPFAX Defaults for unsupported Job-Template Attributes

Job Template attribute	IPPFax default behavior
copies (integer(1:MAX))	1 copy
finishings (1setOf type2 enum)	Administrator configuration
job-hold-until (type3 keyword name(MAX))	'no-hold'
job-priority (integer(1:100))	Administrator configuration
job-sheets (type3 keyword name(MAX))	Administrator configuration
multiple-document-handling (type2 keyword)	No multiple document jobs
number-up (integer(1:MAX))	1
orientation-requested (type2 enum)	Administrator configuration
page-ranges (1setOf rangeOfInteger(1:MAX))	1:MAX
print-quality (type2 enum)	Administrator's choice
printer-resolution (resolution)	Administrator configuration
sides (type2 keyword)	Administrator configuration

551 7.2.2.1 media (type2 keyword | name(MAX))

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 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 Sender MUST supply Media Size Self Describing names defined in [PWG5101.1].

557 A Receiver MUST at least support the sizes 'na_letter_8.5x11in' and 'iso_a4_210x297mm' and MUST be
 558 able to print on at least one of those two sizes. The Receiver MAY scale down at most 10% (PDF/is
 559 directives may prohibit this scaling for quality reasons), overflow to another page, or truncate. If the
 560 Receiver does truncate then it MUST notify the Receiving User. A Receiver MUST perform only
 561 isomorphic scaling.

562
 563 A Sender SHOULD use PDF Crop boxes 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 1/2 of an inch, then the Sender can be sure that the majority of Receivers can print the complete
 566 image without loss of data. However, this does not eliminate that the possibility that data may be lost.
 567

568 **7.2.2.2 media-supported**

569 The following standard keywords MUST be supported. Any other paper sizes supported MUST use the
570 self-describing names as defined in ([PWG5101.1]):

571 ‘na_letter_8.5x11in’

572 ‘iso_a4_210x297mm’

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

574 ‘iso_a4_210x297mm’ and indicates that either is acceptable. See [PWG5100.7].

575 **7.2.3 Delivery Confirmation using the Print-job response**

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

580 **7.2.4 Originator identifier image**

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

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

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

588 **Reference PDF/is method.**

589 **7.3 Cancel-Job operation**

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

591 **7.4 Get-Job-Attributes**

592 **7.5 Get-Jobs**

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

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

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

599 job-id, job-uri
600 job-k-octets, job-k-octets-completed
601 job-media-sheets, job-media-sheets-completed,
602 time-at-creation, time-at-processing
603 job-state, job-state-reasons
604 **number-of-intervening-jobs – NOT!!!!**
605

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

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

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

613 An IPP administrator MAY read all attributes.

614 **8 Security considerations**

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

620 8.1 Data Integrity and authentication

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

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

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

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

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

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

634 8.2 Data Privacy (encryption)

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

636 **8.3 uri-authentication-supported (1setOf type2 keyword)**

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

639 **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

640 * TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA mandated by [RFC2246].

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

643 **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

644

645 **8.4 uri-security-supported (1setOf type2 keyword)**

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

648 **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

649

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

652 **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

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

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

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

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

661 8.5 Using IPPFAX with TLS

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

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

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

- 672 IPP/1.1 sequence:
- 673 1. Start TCP connection
 - 674 2. Zero or more HTTP/IPP requests
 - 675 3. HTTP/IPP request with Upgrade to TLS header
 - 676 4. TLS handshake
 - 677 5. Finish the HTTP/IPP request securely
 - 678 6. Send more HTTP/IPP requests securely ...

- 679
- 680 IPPFAX sequence:
- 681 1. Start TCP connection
 - 682 2. Send TLS ClientHello
 - 683 3. Rest of TLS handshake
 - 684 4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
 - 685 followed by the Print-Job operation).
 - 686

687 **8.6 Access control**

688 **Needs re-writing**

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

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

696 **8.7 Reduced feature set**

697 **Needs re-writing**

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

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

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

706 **9 Attribute Syntaxes**

707 No new attribute syntaxes are defined.

708 **10 Status codes**

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

710

711 **11 Conformance Requirements**

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

713 **11.1 Operation Conformance Requirements**

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

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

725

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				

726

Legend:

727

728

Legend:

729

MAY* - Get-Job-Attributes restricts certain. See section 7.4.

730

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

731

732

733

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

734

735

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

736

737

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.

738

739

740

741

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

742

743

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

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

758 12 IPPFAX URL Scheme

759 Need to be re-worked to be consistent RFC 3510

760 Need to register a port with IANA for IPPFax.

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

763 12.1 IPPFAX URL Scheme Applicability and Intended Usage

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

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

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

772 **12.2 IPPFAX URL Scheme Associated IPPFAX Port**

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

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

776 **12.3 IPPFAX URL Scheme Associated MIME Type**

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

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

781 **12.4 IPPFAX URL Scheme Character Encoding**

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

788 **12.5 IPPFAX URL Scheme Syntax in ABNF**

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

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

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

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

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

```
800     ippfax_URL = "ippfax:" "//" host [ ":" port ] [ abs_path [ "?" query ] ]
801
```

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

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

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

811 12.6 IPPFAX URL Examples

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

```
814     ippfax://abc.com
815     ippfax://abc.com/listener
816
```

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

818 The following literal IPv4 addresses:

```
819     192.9.5.5           ; IPv4 address in IPv4 style
820     186.7.8.9          ; IPv4 address in IPv4 style
821
```

822 are represented in the following example IPPFAX URLs:

```
823     ippfax://192.9.5.5/listener
824     ippfax://186.7.8.9/listeners/tom
825
```

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

```
827     ::192.9.5.5        ; IPv4 address in IPv6 style
828     ::FFFF:129.144.52.38 ; IPv4 address in IPv6 style
```


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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

980

1. Appendix A:

981 **16 Appendix B: vCard Example**982 **Update the example**

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

```

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

```

994

995

996 **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

			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.

997

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