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IEEE-ISTO

Printer Working Group

IPP Fax Project

Standard for IPPFAX/1.0 Protocol

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Working Draft

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. In addition, IPPFAX/1.0 REQUIRES the support of the IPP Event Notification mechanism [ipp-ntfy] using the 'ippget' Pull Delivery Method [ipp-get-method].

An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least the PDF/is as specified in [ifx-pdfis] 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.

31 This document is available electronically at: [wd-ifx10-20031105.pdf, .doc](#)

32 A version showing the changes from the previous version is available at: [wd-ifx10-20031105-rev.pdf](#)

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

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41 Title: The IPPFAX/1.0 Protocol

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75 work together better. All references to the PWG in this document implicitly mean "The Printer Working Group, a
76 Program of the IEEE ISTO." In order to meet this objective, the PWG will document the results of their work as open
77 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
78 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
79 standards.

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81 multiple, independent and interoperable implementations with substantial operational experience, and enjoys
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84 Contact information:

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

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

88 1) send it to majordomo@pwg.org

89 2) leave the subject line blank

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

91 subscribe ifx

92 end

93

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

96

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202 **NOTE: Remove all references to Create-Job/Send-Document**

203 1 Introduction

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

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

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

215 The IPPFAX/1.0 protocol is a specialization of the IPP/1.1 [RFC2911], [RFC2910] protocol supporting a
216 subset of the IPP operations with increased conformance requirements in some cases, some restrictions in
217 other cases, and some additional REQUIRED attributes. The IPPFAX Protocol uses the 'ippfax' URL
218 scheme (instead of the 'ipp' URL scheme) for all operations. Most of the new attributes defined in this
219 document MAY be supported by IPP Printers as OPTIONAL extensions to IPP as well. Only the attributes
220 defined in this document that start with the "ippfax-" prefix MUST NOT be used in the IPP Protocol (see
221 section 1.3). In addition, IPPFAX/1.0 REQUIRES the support of the IPP Event Notification mechanism
222 [ipp-ntfy] using the 'ippget' Pull Delivery Method [ipp-get-method]. See section 1 for a comparison of IPP
223 and IPPFAX.

224 An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least PDF/is [ifx-pdfis]
225 which is defined for the 'application/pdf' document format MIME type. A Print System MAY be
226 configured to support both the IPPFAX and IPP protocols concurrently for a single output device (or
227 multiple output devices), but each protocol requires separate Printer objects with distinct URLs. Note - It
228 is assumed that the reader is familiar with IPP/1.1 [RFC2911], [RFC2910], [RFC3196], and [ipp-iig-bis].
229 See section 1.

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

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

237

1.1 Operations used

238 For each IPPFAX Job, the Sender sends at least the following operations to the Receiver in the
239 following order:

- 240 1. Get-Printer-Attributes - Sender MUST verify that the Printer object is an (IPPFAX) Receiver
241 and MUST determine the Receiver's basic capabilities.
- 242 2. Validate-Job – Unless no job-template attributes are submitted and the document-format is
243 PDF/is and the media-type is A4 or NA-letter, the Sender MUST verify that the Receiver can
244 support the Job attributes that the Sender will send in the IPPFAX Job. Note that a Sender
245 MUST send the Validate-Job command to verify that the Operation and Job-Template
246 attributes requested will be accepted by the Receiver. This is especially important if the
247 document data is very large.
- 248 3. Print-Job - Sender MUST submit the IPPFAX job with a single document (Create-Job, Send-
249 document and Send-URI and Print-URI must not be supported by Senders or Receivers).
- 250 4. Get-Job-Attributes - The Sender MUST support and MUST use this operation to check for
251 successful job completion unless the Sending User wishes otherwise. Job-History MUST be
252 retained by the Receiver for at least 5 minutes after job completion. See 4.3.7.2 of RFC2911 for
253 printer object Job-History discussion.

254

1.2 Typical exchange

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

- 257 1. The Sending User determines the network location of the Receiver (value of the “printer-uri”
258 operation attribute) – see section 4.1. This document does not specify how the Sending User does
259 this. Possible methods include directory lookup, search engines, business cards, network
260 enumeration protocols such as SLP, etc. See section 0 for the Generic Directory Schema for
261 IPPFAX.
- 262 2. The Sending User either (1) loads the Document into the Sender or (2) causes the Sender to
263 generate the Document data by means outside the scope of this document, indicates the Receiver's
264 network location and starts the exchange.
- 265 3. The Sender MUST validate whether or not the Receiver is an IPPFAX-capable Printer and
266 SHOULD determine the basic capabilities of the Receiver, including document format – see
267 section 7.1.

- 268 4. The Sender selects the most appropriate data format depending on the Receiver's basic capabilities.
269 The PDF/is data format is described in detail in the "PDF Image-Streamable (PDF/is)" specification
270 [ifx-pdfis].
- 271 5. The Sender MUST validate whether or not the Receiver will accept all of the attributes of the
272 IPPFAX Job from this Sending User using the Validate-Job operation. See section 7.2. If the
273 Receiver rejects the Validate-Job operation, the Sender can avoid sending the data.
- 274 6. The Sender either (1) scans the Document and converts it into an acceptable data format or (2)
275 generates or forwards the Document representation in an acceptable data format – see section 6.5.
- 276 7. As part of the Validation and Job creation, the following identities are determined and exchanged:
277 Sender, Sending User, Receiver, and Receiving User – see section 8.
- 278 8. The Sender transmits the Document data to the Receiver – see section 9.
- 279 9. The Sending User receives a confirmation that the Receiver received the Document data – see
280 section 9.3.
- 281 10. In addition the Sender MUST support and the Sending User MAY choose to receive an Event
282 Notification that the Document has been successfully Delivered – see sections 1.1 and 1.

283 If the Sender is unable to initiate or complete the exchange then it is assumed that the Sender will perform
284 some form of retry. The mechanisms used and the user-visible behavior in this case is an implementer's
285 choice and beyond the scope of this document.

286 1.3 Namespace used for attributes

287 Most of the new attributes defined in this document are intended to be used by both the IPP and IPPFAX
288 protocols. As such, these attributes have neither the "ipp-" nor the "ippfax-" prefix in their names. The
289 few attributes that are intended only for use in the IPPFAX protocol start with the "ippfax-" prefix in order
290 to indicate their limited scope of usage. Such attributes (e.g., "ippfax-versions-supported") MUST NOT be
291 supported by the IPP Protocol, i.e., MUST NOT be supported by IPP Printer objects.

292 On the other hand, unless explicitly specified otherwise, all existing IPP attributes, including future IPP
293 extensions, apply to the IPPFAX Protocol as well, including attributes which have an "ipp-" prefix. For
294 example, the IPP/1.1 "ipp-attribute-fidelity" operation attribute (see [RFC2911] section 3.2.1.1 and 3.2.1.2)
295 and the IPP/1.1 "ipp-versions-supported" Printer Description attribute (see [RFC2911] section 4.4.14) are
296 also used in the IPPFAX protocol, even though they have the "ipp-" prefix.
297

298 **2 Terminology**

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

300 **2.1 Conformance Terminology**

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

308 **2.2 Other Terminology**

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

311 **IPP Protocol** The protocol defined in [RFC2911] and [RFC2910] and any IPP Protocol Extension
312 document (see section 17). For the IPP/1.1 Protocol each operation request must use the ‘ipp’ URL
313 scheme.

314 **IPPFAX Protocol** The protocol defined in this or a future revision document and any future extension
315 document. For the IPPFAX Protocol each operation request **MUST** use the ‘ippfax’ URL scheme (see
316 section 4.1 and 15). Unless a specific version number is appended to “IPPFAX”, such as “IPPFAX/1.0”,
317 the term IPPFAX applies to all versions.

318 **Printer object (or Printer)** A hardware or software entity that accepts protocol operation requests and
319 returns protocol responses. A Printer object **MAY** be: (1) an IPP Printer object or (2) an IPPFAX Printer
320 object, **DEPENDING ON IMPLEMENTATION** (see section 3.3), but **MUST NOT** be both (since they
321 support some different operations and attributes and are really two different kinds of Print Services). A
322 Printer object **MAY** support multiple URLs with different security, authentication, and/or access control
323 (see [RFC2911] sections 4.4.1, 4.4.2, 4.4.3, and 8). However, each URL for a Printer object **MUST**
324 support the same operations and attributes with the same values, except as restricted depending on the
325 security, authentication, and/or access control implied by the URL. In other words, each URL for a given
326 Printer object is offering the same Print Service.

- 327 Note: For brevity, this document uses the term “Receiver” instead of “IPPFAX Printer object”.
328 This document uses the term “Printer object” (and “Printer”) when the statement is intended to
329 apply to a Printer object that MAY support the IPP Protocol or the IPPFAX protocol (but not both).
- 330 **Print Service** The print functionality offered by a Printer object. Several different Printer objects MAY
331 offer the same Print Service.
- 332 **IPP Printer object** A Printer object that supports the IPP Protocol and offers the IPP Print Service (by
333 definition).
- 334 **Receiver** The Printer object that accepts IPPFAX protocol operations and receives the Document sent by
335 the Sender. A Receiver offers the IPPFAX Print Service (by definition).
- 336 **Print System** All of the Printer objects on a single managed host network node. A Print System MAY
337 support IPP and IPPFAX protocols concurrently (see section 3.3) for a single output device (or multiple
338 output devices), but each protocol requires separate Printer objects with distinct URLs.
- 339 **client** A hardware and/or software entity that initiates protocol operation requests and accepts responses.
340 A client MAY be: (1) an IPP client, (2) an IPPFAX client, or (3) both. However, this document uses the
341 term “Sender”, instead of “IPPFAX client”. This document uses the term “client” when the statement is
342 intended to apply to a client that MAY support the IPP Protocol, the IPPFAX protocol, or both protocols.
- 343 **IPP client** A client that uses the IPP Protocol to interact with an IPP Printer object.
- 344 **Sender** A client that uses the IPPFAX Protocol to query a Receiver and transmit a Document to that
345 Receiver.
- 346 **Document** The electronic representation of a set of one or more pages that the Sender sends to the
347 Receiver.
- 348 **Sending User** The person interacting with the Sender.
- 349 **Receiving User** The intended human recipient of the Document being sent by the Sender to the Receiver.
- 350 **IPP Job** A job submitted by an IPP client to an IPP Printer object using the IPP Protocol.
- 351 **IPPFAX Job** A job submitted by a Sender to a Receiver using the IPPFAX Protocol.
- 352 **PDF/is** The file format defined by [ifx-pdfis].
- 353 **Delivered** The Receiver has either printed the Document and delivered the last sheet to the output bin or
354 has forwarded the Document to some other system.

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

358 The terminology defined in the IPP “Event Notifications and Subscriptions” specification [ipp-ntfy] and
359 “The ‘ippget’ Delivery Method for Event Notifications” specification [ipp-get-method], such as **Event**
360 **Notification**, **Event**, **Subscription Object**, **Per-Job Subscription**, **Per-Printer Subscription**, **Push**
361 **Delivery Method**, and **Pull Delivery Method** is also used in this document with the same capitalization
362 conventions and semantics.

363 **3 IPPFAX Model**

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

365 **3.1 Printer Object Relationships**

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

371 **3.2 A Printer object with multiple URLs**

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

376 The three parallel “printer-uri-supported” (1setOf uri), “uri-authentication-supported” (1setOf type2
377 keyword), and “uri-security-supported” (1setOf type2 keyword) Printer Description attributes (see
378 [RFC2911] sections 4.4.1, 4.4.2, and 4.4.3, respectively) MUST contain the URLs, authentication, and
379 security, respectively, supported by the Printer object. See also the OPTIONAL “printer-xri-supported”
380 (collection) Printer Description attribute [ipp-set-ops], which, if supported, MUST be used to set these
381 three parallel attributes using the protocol. [ipp-set-ops] and other system administrator operations MUST
382 only be supported if TLS client authentication has been performed and the system administrator role has
383 been confirmed.

384 Note: For a Printer object that supports multiple URLs, neither the IPP/1.1 protocol nor the IPPFAX/1.0
385 protocol provides a way for the administrator to Set or Get the values of Printer attributes whose values
386 MAY depend on the URL used and/or MAY depend on the authenticated role of the requesting user. So,
387 for example, there is no way to set the differing values of the “operations-supported” Printer attribute (see
388 section 6.4) that depend on the URL using the IPP or IPPFAX protocol. Providing such means is left for
389 future work as a single specification for use by both IPP and IPPFAX.

390 **3.3 A Print System supporting both IPP and IPPFAX** 391 **protocols**

392 From section 3.2, if a Print System supports both IPP and IPPFAX, it MUST do so with separate Printer
393 objects, not with a single Printer object with IPP and IPPFAX URLs. Each such Printer object MUST
394 support either IPP or IPPFAX, but not both. In other words, each URL for a Printer object MUST have the
395 same scheme, namely, ‘ipp’ or ‘ippfax’, i.e., MUST NOT have some URLs with the ‘ipp’ scheme and other
396 URLs with the ‘ippfax’ scheme. The reason for this requirement for separate Printer objects for IPP and
397 IPPFAX is because a URL and its Printer object is intended to represent a network resource offering a
398 particular type of service, not several different types of services.

399 Note: it is possible to support IPP and IPPFAX Printer objects with a single piece of code in a Print
400 System with conditional branching to handle the differences in conformance requirements between IPP and
401 IPPFAX. For example, such conditional branching could depend on the “printer-uri” operation attribute
402 supplied by the client in each request to the Print System. See section 1 for a comparison of IPP/1.1 and
403 IPPFAX/1.0.

404 **4 Common IPPFAX Operation Attribute Semantics**

405 This section describes the IPPFAX/1.0 operation attribute semantics that are common to all operations.
406 IPPFAX/1.0 does not define any new operations. Instead, IPPFAX/1.0 semantics are provided using
407 existing IPP operations in [RFC2911], [ipp-ntfy], [ipp-get-method], [ipp-set-ops], etc. with increased
408 conformance requirements as specified in this document.

409 **4.1 printer-uri (uri) operation attribute ([RFC2911]** 410 **section 3.1.5)**

411 This operation attribute specifies the transfer path to the Receiver for the operation. As in IPP/1.1, the
412 client MUST supply the “printer-uri” operation attribute in every IPPFAX request (see [RFC2911] section
413 3.1.5). For IPPFAX, the attribute value MUST be a URL using the ‘ippfax’ scheme (see section 15)
414 specifying the Receiver’s network location.

447
448

4.3 ippfax-version-number (type2 keyword) operation attribute

449 The value of this operation attribute indicates the version of the IPPFAX Protocol and encoding that the
450 Sender is requesting and the Receiver is returning. The Sender MUST supply this operation attribute in
451 every request and the Receiver MUST return this operation attribute in every response. This operation
452 attribute MUST be placed in the Operation Attributes Group *immediately* after the operation attributes
453 whose order is specified in IPP/1.1 [RFC2911]. The semantics of the “ippfax-version-number” operation
454 attribute serves the same purpose for the IPPFAX Protocol as the IPP/1.1 “version-number” parameter
455 serves for the IPP Protocol (see [RFC2911] section 3.1.8).

456 If the Sender does not supply this attribute, the Receiver MUST reject the operation, MUST return the
457 ‘client-error-bad-request’ status code, and SHOULD return the ‘ippfax-version-number’ attribute name
458 keyword in the Unsupported Attributes Group (see section 0).

459 For IPPFAX version 1.0 as specified in this document, the value of the “ippfax-version-number” operation
460 attribute MUST be ‘1.0’ keyword value. By including an IPPFAX version number in the client request, it
461 allows the Sender to identify which version of IPPFAX the Sender is requesting to be used, i.e., the version
462 whose conformance requirements the Sender may be depending upon the Receiver to meet.

463 The Receiver MUST indicate the IPPFAX versions supported using the “ippfax-versions-supported”
464 (1setOf type2 keyword) Printer Description attribute (see section 6.3).

465 As in IPP/1.1, if the Receiver does not support the major version number supplied by the Sender, i.e., the
466 major version field of the “ippfax-version-number” operation attribute does not match any of the values of
467 the Printer’s “ippfax-versions-supported” (see section 6.3), the Receiver MUST respond with a status code
468 of ‘server-error-version-not-supported’ along with the closest version number that is supported (see
469 [RFC2911] section 13.1.5.4). If the major version number is supported, but the minor version number is
470 not, the Receiver SHOULD accept and attempt to perform the request (or reject the request if the operation
471 is not supported), else it rejects the request and returns the ‘server-error-version-not-supported’ status code.
472 In all cases, the Receiver MUST return the “ippfax-version-number” operation attribute in the response
473 with the value that it supports that is closest to the version number supplied by the Sender in the request.

474 There is no version negotiation per se. However, if after receiving a ‘server-error-version-not-supported’
475 status code from a Receiver, a Sender SHOULD try again with a different version number. A Sender MAY
476 also determine the versions supported either from a directory (see section 0) or by querying the Printer
477 object’s “ipp-versions-supported” (see section 6.2) and “ippfax-versions-supported” attributes (see section
478 6.3) to determine which IPP and IPPFAX versions are supported, respectively, as part of IPPFAX.

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

481 **5 Get-Printer-Attributes operation semantics**

482 The Receiver MUST support the Get-Printer-Attributes operation as defined in [RFC2911] as extended by
483 the semantics defined in this section.

484 **5.1 document-format (mimeType) operation** 485 **attribute ([RFC2911] section 3.2.5.1)**

486 This operation attribute identifies the document-format for which the Receiver MUST return the supported
487 values of the requested attributes. The semantics of this Get-Printer-Attributes operation attribute is the
488 same as for IPP ([RFC2911] section 3.2.5), with the following conformance requirement changes:

- 489 1. The Sender SHOULD supply the “document-format” operation attribute (IPP client may) and, if
490 supplied, the value MUST be “application/PDF”.

491 **6 IPPFAX Printer Description Attributes**

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

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

496 All Printer Description attributes not listed in Table 1 have the same conformance requirements as defined
497 in IPP/1.1 [RFC2911] or IPP Notifications [ipp-ntfy]. Any other Printer Description attributes defined in
498 other documents are OPTIONAL for IPPFAX.

499 See section 9.2 for the Receiver conformance requirements for the “xxx-supported”, “xxx-default”, and
500 “xxx-ready” Job Template Printer attributes.

501

Table 1 - Printer Description attributes conformance requirements

Attribute Name (attribute syntax)	IPP Printer support [RFC 2911]	IPP Fax Receiver support	Section
printer-uri-supported (1setOf uri) *	must	MUST	6.1, Error! Reference source not found.
ipp-versions-supported (1setOf type2 keyword) *	must	MUST***	6.2
ippfax-versions-supported (1setOf type2 keyword)	MUST NOT	MUST***	6.3
operations-supported (1setOf type2 enum) *	must	MUST	6.4
document-format-supported (1setOf mimeType) *	must	MUST	6.5
document-format-version-supported (1setOf text(127)) **	----	MUST	6.6
digital-signature-supported (1setOf type2 keyword) **	----	MUST	6.7
pdl-override-supported (type2 keyword) *	must	MUST	6.8

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

504 ** These attributes are defined in [?JobX extensions?], but have enhanced or constrained semantics defined
505 in this document.

506 *** A Printer object that supports IPPFAX MUST NOT support IPP as well, but MUST support the “ipp-
507 versions-supported” attribute to indicate the version(s) of IPP that are supported *as part of IPPFAX*
508 *operations*. A Print System that supports both IPP and IPPFAX MUST support them as separate
509 Printer objects (see section 3.3).

510

6.1 printer-uri-supported (1setOf uri) ([RFC 2911] section 4.4.1)

511

512 This attribute contains the set of target URIs that the Receiver supports, i.e., the URI values that a client
513 can supply as values of the “printer-uri” target operation attribute in requests. As in IPP/1.1, the Receiver
514 MUST support this Printer Description attribute (see [RFC2911] section 4.4.1). However, a single Printer
515 object MUST NOT support both ‘ipp’ and ‘ippfax’ schemed URIs. Therefore, the schemes MUST all be
516 ‘ipp’ or all ‘ippfax’. In order for a Print System to support both IPP and IPPFAX, it MUST use separate
517 Printer objects (see section 3.3).

518 If a Print System supports both the IPP and IPPFAX protocols, it is RECOMMENDED that the Print
519 System support Printer objects whose target URIs differ only in the scheme. Then a client that queries the
520 “printer-uri-supported” attribute of one of the Printer objects with one of these two protocols, can query the

521 same Print System with the other protocol just by changing the scheme to see if the other protocol is
522 supported (as a separate Printer object).

523 The Receiver MUST support the ‘ippfax’ URL scheme (see section 15) and only the ‘ippfax’ URL scheme
524 for this attribute (see section 3.3).

525 **6.2 ipp-versions-supported (1setOf type2 keyword)** 526 **([RFC2911] section 4.4.14)**

527 This attribute identifies the version or versions of the IPP Protocol that this Receiver supports as part of the
528 IPPFAX Protocol (rather than indicating that the Receiver supports the IPP Protocol), including major and
529 minor versions, i.e., the version numbers for which this Receiver meets the conformance requirements.
530 The Receiver MUST support this Printer Description attribute. The Receiver MUST compare the “version-
531 number” parameter (see section 4.2), with the values of this attribute in order to determine whether the
532 Printer supports the IPP version requested by the Sender *as part of the IPPFAX Protocol*.

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

534 ‘1.1’: The “IPP part” of the IPPFAX operations meets the protocol and encoding conformance
535 requirements of IPP version 1.1 as specified in [RFC2911], [RFC2910], and IPP extensions.
536

537 Note: As in [RFC2911] section 4.4.14, these version keyword values violate the syntax for
538 keywords, by starting with an ASCII digit, instead of an ASCII lower case letter.

539 **6.3 ippfax-versions-supported (1setOf type2 keyword)**

540 This attribute identifies the version or versions of the IPPFAX Protocol that this Receiver supports,
541 including major and minor versions, i.e., the version numbers for which this Receiver meets the
542 conformance requirements. The support of this attribute indicates that this Printer object is a Receiver as
543 opposed to an IPP Printer object. The Receiver MUST support this Printer Description attribute. An IPP
544 Printer object MUST NOT support this attribute, since a Printer object MUST NOT support both IPP and
545 IPPFAX (see section 3.3).

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

549 Since a Printer object MUST NOT support both the IPP and IPPFAX protocols, there is no ambiguity with
550 requiring a Receiver to support both the “ipp-versions-supported” and “ippfax-versions-supported” Printer
551 Description attributes (see sections 6.2 and 6.3). If a Printer object supports the “ipp-versions-supported”

552 attribute, but not the “ippfax-versions-supported” attribute, then by definition that Printer object supports
553 the IPP Protocol. If a Printer object supports the “ippfax-versions-supported” Printer Description attribute,
554 then by definition that Printer object is a Receiver and supports the IPPFAX Protocol and not the IPP
555 Protocol. For such a Printer object, the “ipp-versions-supported” attribute indicates the versions of IPP that
556 it supports *as part of IPPFAX operations*, rather than indicating that it supports the IPP Protocol (by itself).

557 Standard keyword values are:

558 ‘1.0’: Meets the conformance requirements of IPPFAX version 1.0 as specified in this document.

559
560 Note: As in [RFC2911] section 4.4.14, these version keyword values violate the syntax for
561 keywords, by starting with an ASCII digit, instead of an ASCII lower case letter. However, for
562 consistency with IPP, these IPPFAX version keyword values are defined compatibly with the IPP
563 version keyword values.

564 **6.4 operations-supported (1setOf type2 enum) ([RFC** 565 **2911] section 4.4.15)**

566 This attribute identifies the set of supported operations for this Receiver and contained Job objects. As in
567 IPP/1.1, the Receiver MUST support this Printer Description attribute (see [RFC2911] section 4.4.15).

568 The values of this attribute MAY depend on the URL supplied in the “printer-uri” operation attribute
569 and/or MAY depend on the authority of the authenticated requesting user. For example, a Receiver that
570 supports administrative operations MUST NOT support administrative operations for use by end users, but
571 such a Receiver MAY return the administrative operation enums to end users.

572 While all current operations are currently supported, future versions of IPPFax may introduce additional
573 operations.

574 **The list of operations is restricted! This section should list all the operations that we allow/disallow**

575 **6.5 document-format-supported (1setOf** 576 **mimeMediaType) ([RFC 2911] section 4.4.22)**

577 This attribute identifies which document formats the Receiver supports. As in IPP/1.1, the Receiver MUST
578 support this Printer Description attribute (see [RFC2911] section 4.4.22).

579 Since most document formats don’t give the “blind interchange” guarantee of document presentation
580 fidelity for all implementations and configurations, the IPPFAX document formats supported MUST be a
581 subset of the IPP document formats supported.

582 Both the Sender and Receiver MUST only support application/pdf.

583 **6.6 document-format-version-supported (1setOf**
584 **text(127))**

585 **CHANGE: Reference the “Job X extensions” Specification.**

586 This attribute identifies which PDF formats the Receiver supports. A Receiver MUST support this
587 attribute, a Sender MAY support this attribute.

588 Both the Sender and Receiver MUST support “PDF/is-1.0”. The Receiver MAY support other versions of
589 PDF and if it does then the Receiver MUST only list formats that it fully supports.

590 **6.7 digital-signatures-supported (1setOf type2**
591 **keyword)**

592 This attribute identifies which digital signature technologies are supported by the Receiver. A Receiver
593 MUST support this Printer Description attribute.

594 **Digital-signature and digital-signature-supported will move to [jobX] specification. Reference them from**
595 **that specification**

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

598 **6.8 pdl-override-supported (type2 keyword)**

599 This attribute expresses the ability for a particular Receiver implementation to either attempt to override
600 document data instructions with IPPFAX attributes or not.

601
602 This attribute MUST have the value ‘attempted’ or a higher quality IANA-registered value (such as a
603 hypothetical ‘guaranteed’ value), and the Receiver MUST attempt to override at least the media.

604
605 NOTE: RFC2911 only requires that the attribute be supported but the supported may be not-attempted

606 **7 Sender Validation of the Receiver’s Capabilities**

607 This section describes how a Sender MUST first validate the target Printer as a Receiver and determines its
608 basic capabilities (section 7.1) and then validate the IPPFAX Job (section 7.2).

609 **NOTE: This WHOLE section needs revision and possible wholesale deletion**

610 **7.1 Sender Validates the target Printer as a Receiver**
611 **and determines its basic capabilities**

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

615

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

Attribute	Ref.	Sender action
Operation attributes:		
printer-uri	4.1	Sender MUST validate whether or not the Get-Printer-Attributes operation with a “printer-uri” target URL using the ‘ippfax’ scheme locates a valid Receiver destination.
Printer Description attributes:		
ippfax-versions-supported	6.3	Sender MUST check whether the Printer supports the IPPFAX Protocol on the target URL by checking whether or not the Printer supports this attribute, i.e., validate that the Printer is a Receiver.
operations-supported	6.4	If the Sender is going to use any operations that are OPTIONAL for a Receiver to support (such as Create-Job, Send-Document), the Sender SHOULD validate that the Receiver supports such operations (though the Printer MUST return an error if the client attempts to use an operation that the Printer doesn’t support).
document-format-supported	6.5	Sender SHOULD** check which document formats the Receiver supports.
document-format-version-supported	6.6	Sender SHOULD** check which PDF versions the Receiver supports.
Job Template Printer attributes:		
media-supported	9.2.1.1	Sender SHOULD** check which media is supported, if the Sender specifies a particular media.
printer-resolutions-supported	1.1	Sender SHOULD** check which resolutions are supported, so that it can use the highest resolution supported by the Receiver.

616 ** SHOULD** indicates that the Sender SHOULD check, but that if the Sender doesn’t, then the Validate-
617 Job operation will catch any unsupported attributes or values and reject the operation.

618

619

7.2 Validating the Printer’s IPPFAX capabilities using the Validate-Job operation

620 After validating that the Printer is a Receiver (section 7.1), the Sender MUST validate the job attributes
621 using the Validate-Job operation (that doesn’t include any Document data) before sending the IPPFAX Job
622 with the same attributes using an IPPFAX Print-Job/Create-Job operation. The Sender MUST supply all
623 the same operation and Job Template attributes in the Validate-Job request as it will supply in the
624 subsequent Print-Job/Create-Job request (see section 9).

625 The Sender MUST supply the “ipp-attribute-fidelity” operation attribute with a ‘true’ value (see
626 [RFC2911] section 3.2.1.1 and 15.1) in both the Validate-Job and the Print-Job/Create-Job operations.

627 Then the Receiver will reject the request if any of the Job Template attributes and values are not supported,
 628 thereby ensuring that the document is printed as intended. If the Validate-Job is rejected because of the
 629 lack of support of one or more Job Template attributes, the Sender MUST query the user in order to
 630 proceed without these attributes. If the Validate-Job fails for more serious reasons, such as ‘server-error-
 631 not-accepting-jobs’ ([RFC2911] section 13.1.5.7), the Sender MUST inform the Sending User so that
 632 person has the opportunity to choose to abandon the exchange or to try an IPP URL (see section 6.1) and
 633 then query the Sending User if it is OK to use the IPP Protocol. The main IPPFAX features that MAY be
 634 missing in the IPP Protocol are:

- 635 - Guaranteed exchange: Since IPP does not mandate any data formats it is possible that the
 636 Sender MAY not be able to discover a common data format that both it and the printer support.
- 637 - Identity exchange (section 8): IPP need not provide the definitive identity exchange that
 638 IPPFAX does. In many cases this is acceptable.

639 8 Identity exchange

640 **Need to move these in with the other operation attributes (section 9) and remove section 8**

641 This section defines the attributes that the Sender and the Receiver can use to identify each to the other and
 642 to identify the Sending User and the Receiver User. Table 3 lists these attributes and shows the Sender and
 643 Receiver conformance requirements.

644 **Table 3 - Summary of Identify Exchange attributes**

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

645 * Sender supplies in a Validate-Job, Print-Job, and Create-Job operation.

646 8.1 sending-user-vcard (text(MAX)) operation/Job 647 Description attribute

648 This operation attribute identifies the Sending User in MIME vCard v3.0 [RFC2426, RFC2425] format.
 649 The Sender MAY send this operation attribute in an IPPFAX Print-Job/Create-Job operation. The Receiver
 650 MUST support this Print-Job/Create-Job and Validate-Job operation attribute according to the vCard v3.0
 651 specification and MUST populate the job’s corresponding Job Description attribute. The Receiver MUST
 652 support MAX (1023) octets of text. However, the Receiver MAY ignore any image, logo, and sound parts,
 653 in which case it MUST still accept the Print-Job/Create-Job request and return the ‘successful-ok-ignored-

654 or-substituted-attributes' status code (see [RFC2911] section 13.1.2.2), but NEED NOT return the attribute
655 and its ignored values in the Unsupported Attributes Group.

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

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

665 **8.2 receiving-user-vcard (text(MAX)) operation/Job** 666 **Description attribute**

667 This operation attribute identifies the intended Receiving User in MIME vCard format [RFC2426,
668 RFC2425]. The Sender SHOULD send this operation attribute in an IPPFAX Print-Job/Create-Job or
669 Validate-Job operation. The Receiver MUST support this Print-Job/Create-Job operation attribute and
670 MUST populate the job's corresponding Job Description attribute. The Receiver MUST support MAX
671 (1023) octets of text. However, the Receiver MAY ignore any image, logo, and sound parts, in which case
672 it MUST still accept the Print-Job/Create-Job request and return the 'successful-ok-ignored-or-substituted-
673 attributes' status code (see [RFC2911] section 13.1.2.2), but NEED NOT return the attribute and its
674 ignored values in the Unsupported Attributes Group.

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

677 The Receiver MAY choose to use this information on a job start and end sheet (banner page) for the job.
678 See discussion under section 8.1.

679 **8.3 sender-uri (uri) operation/Job Description attribute**

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

685 The Sender **MUST** send this operation attribute with the configured value in an IPPFAX Print-Job/Create-
686 Job operation. The Receiver **MUST** support this Print-Job/Create-Job operation attribute and **MUST**
687 populate the job's corresponding Job Description attribute.

688 The Receiver **MUST** use its value to populate the Job object's corresponding Job Description attribute of
689 the same name. This value is only a comment (since it can be spoofed) and is used for logging purposes
690 and has nothing to do with authentication (for which, see section 11). This attribute is more akin to an
691 email 'Reply-To' field.

692 **9 Submission using Print-Job or Validate-Job**

693 The Sender and Receiver **MUST** support creating IPPFAX Jobs using the Print-Job operation and **MAY**
694 support creating IPPFAX Jobs using Create-Job and Send-Document, as well. The Sender and Receiver
695 **MUST NOT** support print by reference, i.e., **MUST NOT** support the Print-URI and Send-URI operations,
696 since they do not provide the same security and assurance of accessibility as pushing the document data
697 does.

698 **9.1 IPP/1.1 Validate-Job and Print-Job/Create-Job** 699 **operation attributes**

700 Table 4 lists the operation attributes for Validate-Job and Print-Job/Create-Job operations for Senders,
701 IPP/1.1 Printers, and Receivers. Differences in Sender conformance from IPP/1.1 clients are indicated with
702 footnotes. Any other IPP operation attributes defined in other documents are **OPTIONAL** for IPPFAX.

703

Table 4 - [RFC 2911] Validate-Job and Print-Job operation attributes

Operation attribute	Section	Sender supplies	IPP/1.1 [RFC 2911]Printer supports	Receiver supports
attributes-charset (charset)		MUST	must	MUST
attributes-natural-language (naturalLanguage)		MUST	must	MUST
printer-uri (uri) *	4.1	MUST	must	MUST
requesting-user-name (name(MAX)) *		SHOULD	must	MUST
job-name (name(MAX))		MAY	must	MUST
ipp-attribute-fidelity (boolean) *	9.1.1	MUST with 'true' value ¹	must	MUST
document-name (name(MAX)) *		MAY	must	MUST
compression (type3 keyword) *		MAY	must	MUST
document-format (mimeMediaType) *	9.1.2	MUST ²	must	MUST
document-format-version (type2 keyword)	9.1.3	MUST ³	may	MUST
document-natural-language (naturalLanguage) *		MAY	may	MAY
job-k-octets (integer(0:MAX))		MAY	may	MAY
job-impressions (integer(0:MAX))		MAY	may	MAY
job-media-sheets (integer(0:MAX))		MAY	may	MAY
sending-user-vcard (1setOf text(MAX))	8.1	MAY ³	may	MUST
receiving-user-vcard (text(MAX))	8.2	SHOULD ³	may	MUST
sender-uri (name(MAX))	8.3	MUST ³	may	MUST

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

705

706 9.1.1 ipp-attribute-fidelity operation attribute ([RFC2911] section 3.2.1.1)

707 In IPP/1.1, this operation attribute indicates whether or not the client requires the Printer to support all Job
 708 Template attributes and values supplied. The Sender MUST supply this operation attribute in the Validate-
 709 Job and Print-Job/Create-Job operations and the value MUST be 'true'. A Receiver MUST validate and

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].

710 support this operation attribute. Note: [RFC2911] does not REQUIRE the IPP Client to supply this
711 operation attribute and allows the client to supply the ‘false’ value.

712 If the Sender does not supply this attribute or supplies the ‘false’ value, the Receiver MUST reject the
713 operation, MUST return the ‘client-error-bad-request’ status code, and SHOULD return the ‘ipp-attribute-
714 fidelity’ attribute name keyword in the Unsupported Attributes Group (see section 0).

715 **9.1.2 document-format (mimeMediaType) operation attribute ([RFC2911] section 3.2.1.1)**

716 This operation attribute identifies the MIME Media Type of the document that the Sender is sending. The
717 Sender MUST supply this operation attribute in the Validate-Job and Print-Job/Create-Job operations and
718 the value MUST be “application/PDF”. A Receiver MUST validate that the value of attribute is
719 “application/pdf”. Note: [RFC2911] does not REQUIRE the IPP Client to supply this operation attribute.

720 If the Sender does not supply this attribute, the Receiver MUST reject the operation, MUST return the
721 ‘client-error-bad-request’ status code, and SHOULD return the ‘document-format’ attribute name keyword
722 in the Unsupported Attributes Group (see section 0).

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

725 **9.1.3 document-format-version (type2 keyword) operation attribute ([RFC2911] section** 726 **3.2.1.1)**

727 This attribute should be taken from the JobX specification. **Revise this section. Reference the JobX spec.**

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

730 This operation attribute identifies the type2 keyword of the pdf document that the Sender is sending. The
731 Sender MUST supply this operation attribute in the Validate-Job and Print-Job/Create-Job operations. A
732 Receiver MUST validate and support this operation attribute.

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

736 Standard keyword values are defined in section 6.6.

737
738

9.2 Job Template Attributes (for Validate-Job and Print-Job)

739 Table 5 lists all of the Job Template attributes that have enhanced or constrained semantics for IPP Fax.
740 IPP Fax Senders SHOULD NOT supply Job Template attributes except Media[RFC2911].

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

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

747 In Table 5, if the “Sender supply” and “Receiver support” columns contain an explicit single value, the
748 Sender MAY send and the Receiver MAY support the Job Template attribute for an IPPFAX Job. When
749 supported, the Sender MUST send and the Receiver MUST support only the indicated value; that is, there
750 is only one allowed value. Each such single value has been selected as the value for the attribute that would
751 correspond to the *expected behavior* if the attribute were not supported at all. If these attributes are
752 supplied in an IPPFAX Job with any other value, the Receiver MUST reject the Print-Job/Create-Job
753 operation (since the value isn’t supported and “ipp-attribute-fidelity” MUST be ‘true’).

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

759 In Table 5, if the “Sender supply” and “Receiver support” columns contain “MUST NOT”, the Sender
760 MUST NOT supply and the Receiver MUST NOT support the Job Template attribute for an IPPFAX Job.
761 If these attributes are supplied in an IPPFAX Job, the Receiver MUST reject the Print-Job/Create-Job
762 operation (since the attribute isn’t supported and “ipp-attribute-fidelity” MUST be ‘true’). When querying
763 the Receiver with the Get-Printer-Attributes operation, the corresponding “xxx-default” and “xxx-
764 supported” MUST NOT be returned. Note: These are attributes which might degrade the appearance of the
765 document or provide a significantly non-FAX feature and do not have an obvious value which corresponds
766 to the behavior when the attribute is not supported at all, such as media-input-tray-check (type3 keyword |
767 name(MAX)) or output-bin (type2 keyword | name(MAX)).

768

769

770

Table 5 - 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 9.2.1)		[RFC2911]
multiple-document-handling (type2 keyword)	MUST NOT	No multiple document jobs	[RFC2911]
number-up (integer(1:MAX))	MUST NOT	1	[RFC2911]
orientation-requested (type2 enum)	MUST NOT		[RFC2911]

Job Template attribute	Sender supply /Receiver support	IPP Fax behavior	Reference
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 1.1)		[RFC2911]
sides (type2 keyword)	MUST NOT	Administrator's choice	[RFC2911]

771 **9.2.1 media (type2 keyword | name(MAX)) Job Template attribute ([RFC2911] section**
772 **4.2.11)**

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

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

779

780 **NOTE: change references to A4 to ‘iso_a4_210x297mm’ and Letter to ‘na_letter_8.5x11in’**
781

782 At a minimum, an IPPFAX receiver MUST be able to render the sizes ‘na_letter_8.5x11in’
783 ‘iso_a4_210x297mm’ and be able to print on at least one of those two sizes. The Receiver MAY
784 scale down at most 10% (PDF/is directives may prohibit this scaling), overflow to another page, or
785 truncate. If the Receiver does truncate then it MUST notify the Receiving User. Any scaling
786 performed MUST be isomorphic.
787 PDF Crop boxes SHOULD be used when the Sender knows that the imageable region is less than the
788 media size. If the crop box is the union of the lesser size of Letter and A4 minus ¼ of an inch, then the
789 Sender can be sure that the majority of Receivers can print the complete image without loss of data.
790 However, this does mean that there is the possibility that data may be lost.
791

792 Standard keyword values are defined in section 9.2.1.1.

793 **9.2.1.1 media-supported Job Template Printer attributes**

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

796 ‘na_letter_8.5x11in’
797 ‘iso_a4_210x297mm’
798 ‘choice_iso_a4_210x297mm_na_letter_8.5x11in’ - represents both ‘na_letter_8.5x11in’ and
799 ‘iso_a4_210x297mm’ and indicates that either is acceptable. See [jobx].
800
801

802 **9.3 Delivery Confirmation using the Print-job response**

803 The Sender knows when the Receiver has successfully received the entire Document when the Receiver
804 returns the ‘successful-ok’ status code in the Print-Job. The Sender SHOULD then inform the Sending
805 User by means outside the scope of this standard that the document has successfully been received. .

806 **9.4 Originator identifier image**

807 The Sender MUST place an originator identifier, i.e., the value of the “sender-uri” attribute (see section
808 8.3), along with the date and time, in one of the following places, DEPENDING ON
809 IMPLEMENTATION:

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

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

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

815 **Reference PDF/is method.**

816 **10 IPPFAX Implementation of other IPP operations**

817 Section 5 defined the semantic requirements for the Get-Printer-Attributes operation, section 7 defined the
818 semantic requirements for Validate-Job, and section 9 defined the semantic requirements for Print-Job
819 operations for IPPFAX. This section defines the IPPFAX semantics and conformance requirements for the
820 other IPP operations.

821 IPPFAX restricts the use of IPP in certain cases in order to make attaching a Receiver to the Internet a safe
822 option – see section 11.

823 The Receiver MUST fully support the Print-Job, Validate-Job, and Get-Printer-Attributes operations, as
824 defined by this document. The following subsections define restrictions and conformance requirements
825 placed on the Cancel-Job, Get-Job-Attributes, and Get-Jobs, operations. For a conforming IPPFAX
826 Receiver implementation, the support for each of the IPP operations is indicated in Table 6 and Table 7.

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

829 **10.1 Operation Conformance Requirements**

830 Table 6 lists the conformance requirements for Printer operations for (1) an IPP/1.1 Printer ('ipp' URL), (2)
831 the non-privileged IPPFAX Sender, (3) an IPPFAX Receiver receiving a request from a non-privileged
832 User, and (4) an IPPFAX Receiver receiving a request from an authenticated and authorized operator or
833 administrator, if the Receiver supports operator/administrator authentication and authorization.

834 Table 7 lists the conformance requirements for Job and Subscription operations for (1) an IPP/1.1 Printer
835 ('ipp') URL, (2) the non-privileged IPPFAX Sender which MUST be on the same URL as the job was
836 created (the target "printer-uri" MUST match the Job's "job-printer-uri" Job Description attribute), (3) an
837 IPPFAX Receiver receiving a request from the Job or Subscription Object Owner, (4) from some other
838 non-privileged user, and (5) if the operation is supported at all - from an authenticated and authorized
839 operator or administrator.

840 The Receiver MUST support Subscription Creation for the Print-Job/Create-Job operations that it supports,
841 but NEED NOT support any other notification operations, such as Create-Job-Subscriptions, Create-

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

862 job-id, job-uri
863 job-k-octets, job-k-octets-completed
864 job-media-sheets, job-media-sheets-completed,
865 time-at-creation, time-at-processing
866 job-state, job-state-reasons
867 **number-of-intervening-jobs – NOT!!!!**

868
869 The exact choice of Job attributes that a client can query for IPPFAX Jobs, including not returning any,
870 DEPENDS ON IMPLEMENTATION and the security policy in force and is outside the scope of this
871 standard (as in IPP/1.1).

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

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

876 An IPP administrator MAY read all attributes.

877 **11 Security considerations**

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

883 **11.1 Data Integrity and authentication**

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

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

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

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

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

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

897 **11.2 Data Privacy (encryption)**

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

899
900**11.3 uri-authentication-supported (1setOf type2 keyword) ([RFC2911] section 4.4.2)**901 This attribute (see [RFC2911] section 4.4.2) identifies the Client Authentication mechanism associated
902 with each URI listed in the “printer-uri-supported” attribute (see section 6.1).

903

Table 8 - 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

904 * TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA mandated by [RFC2246].

905 Table 9 compares the Digest Authentication requirements for IPP/1.1 clients, IPP/1.1 Printers, IPPFAX
 906 Senders, and IPPFAX Receivers.

907 **Table 9 - 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

908

909 **11.4 uri-security-supported (1setOf type2 keyword)**
 910 **([RFC2911] section 4.4.3)**

911 This attribute (see [RFC2911] section 4.4.3) identifies the security (Integrity and Privacy) mechanisms
 912 used for each URI listed in the “printer-uri-supported” attribute (see section 6.1).

913 **Table 10 - 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

914

915 Table 11 compares the TLS conformance requirements for IPP/1.1 clients, IPP/1.1 Printers, IPPFAX
916 Senders, and IPPFAX Receivers.

917 **Table 11 - 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

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

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

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

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

926 **11.5 Using IPPFAX with TLS**

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

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

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

- 937 IPP/1.1 sequence:
- 938 1. Start TCP connection
 - 939 2. Zero or more HTTP/IPP requests
 - 940 3. HTTP/IPP request with Upgrade to TLS header
 - 941 4. TLS handshake
 - 942 5. Finish the HTTP/IPP request securely
 - 943 6. Send more HTTP/IPP requests securely ...

- 944
- 945 IPPFAX sequence:
- 946 1. Start TCP connection
 - 947 2. Send TLS ClientHello
 - 948 3. Rest of TLS handshake
 - 949 4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
 - 950 followed by Validate-Job and Print-Job operations).

951

952

11.6 Access control

953 Needs re-writing

954 It is expected that the majority of IPPFAX Receivers will operate in a public mode when operating on the
955 Internet, so that anonymous users can send documents without requiring client authentication
956 (corresponding to the 'none' value for the "uri-authentication-supported" attribute - see section 11.3).
957 However a Receiver MAY protect itself using any Client Authentication method specified in [RFC2911]
958 (digest authentication [RFC2069] for example) to restrict access to any or all of its functionality.

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

961 11.7 Reduced feature set

962 Needs re-writing

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

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

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

971 **12 Attribute Syntaxes**

972 No new attribute syntaxes are defined.

973 **13 Status codes**

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

975 .

976 **14 Conformance Requirements**

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

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

- 980 1. A Sender and Receiver MUST observe the attribute name space conventions specified in section
981 1.3.
- 982 2. The Sender MUST supply and the Receiver MUST support (1) the “printer-uri” operation attribute
983 with the ‘ippfax’ scheme, (2) the “version-number” parameter with the IPP/1.1 ‘1.1’ (or higher
984 minor version) value, and (3) the “ippfax-version-number” operation attribute with the IPPFAX/1.0
985 ‘1.0’ keyword value in all operations to get the IPPFAX semantics as described in section 4.
- 986 3. The Receiver MUST support the Get-Printer-Attributes operation as described in sections 5.
- 987 4. The Receiver MUST support the Printer Description attributes as specified in section 6.
- 988 5. The Sender MUST validate that the target Printer is IPPFAX-capable using the Get-Printer-
989 Attributes operation and validate that the Receiver supports the job using the Validate-Job operation
990 as specified in section 7.
- 991 6. The Sender MUST supply and the Receiver MUST support the operation/Job Description attributes
992 for Identify Exchange as described in section 8.

- 993 7. The Sender MUST support submitting and the Receiver MUST accept IPPFAX Jobs as defined in
994 section 9.
- 995 8. The Sender MUST place the Sender's identity in the document according to section **Error!**
996 **Reference source not found.**
- 997 9. The Sender and Receiver MUST support the IPP Notification for Print-Job/Create-Job operations,
998 the 'ippget' Delivery Method, and the Get-Notifications operation for the events indicated in
999 sections 1.1, 1.1, and 1, respectively.
- 1000 10. The Sender and Receiver MUST support the operations as indicated in section 10.
- 1001 11. The Sender and Receiver MUST support the security mechanisms indicated in section 11, including
1002 TLS.
- 1003 The [set-ops], enable-printer and disable-printer operations MUST only be preformed on a connection that
1004 has been authenticated by TLS and the user has the rights to perform them.

1005 **15 IPPFAX URL Scheme**

1006 **Need to be re-worked to be consistent RFC 3510**

1007 **Need to register a port with IANA for IPPFax.**

1008 This section is intended for use in registering the 'ippfax' URL scheme with IANA and fully conforms to
1009 the requirements in [RFC2717].

1010 **15.1 IPPFAX URL Scheme Applicability and Intended** 1011 **Usage**

1012 This document defines the 'ippfax' URL (Uniform Resource Locator) scheme for specifying the location of
1013 an IPPFAX Receiver which implements the IPPFAX Protocol specified in this document.

1014 The 'ippfax' URL scheme defined in this document is based on the ABNF for the basic hierarchical URL
1015 syntax in [RFC2396]; however relative URL forms, parameters, and/or query parts are NOT allowed in an
1016 IPPFAX URL. The 'ippfax' URL scheme is case-insensitive in the host name or host address part;
1017 however the path part is case-sensitive, as in [RFC2396]. Codepoints outside [US-ASCII] MUST be hex
1018 escaped by the mechanism defined in [RFC2396].

1019 The intended usage of the 'ippfax' URL scheme is COMMON.

1020 15.2 IPPFAX URL Scheme Associated IPPFAX Port

1021 All IPPFAX URLs which do NOT explicitly specify a port MUST be used over IANA-assigned well-
1022 known port **xxx [TBA by IANA]** for the IPPFAX Protocol.

1023 See: IANA Port Numbers Registry [IANA-PORTREG].

1024 15.3 IPPFAX URL Scheme Associated MIME Type

1025 All IPPFAX protocol operations (requests and responses) MUST be conveyed in an ‘application/ipp’
1026 MIME media type [RFC2910] as registered in [IANA-MT]. IPPFAX URLs MUST refer to IPPFAX
1027 Receivers which support this ‘application/ipp’ operation encoding.

1028 See: IANA MIME Media Types Registry [IANA-MT].

1029 15.4 IPPFAX URL Scheme Character Encoding

1030 The IPPFAX URL scheme defined in this document is based on the ABNF for the HTTP URL scheme
1031 defined in HTTP/1.1 [RFC2616], which is derived from the URI Generic Syntax [RFC2396] and further
1032 updated by [RFC2732] and [RFC2373] (for IPv6 addresses in URLs). The IPPFAX URL scheme is case-
1033 insensitive in the ‘scheme’ and ‘host’ (host name or host address) part; however, the ‘abs_path’ part is
1034 case-sensitive, as in [RFC2396]. Code points outside [US-ASCII] MUST be hex escaped by the
1035 mechanism specified in [RFC2396].

1036 15.5 IPPFAX URL Scheme Syntax in ABNF

1037 The IPP protocol places a limit of 1023 octets (NOT characters) on the length of a URI (see section 4.1.5
1038 ‘uri’ in [RFC2911]). An IPPFAX Receiver MUST return ‘client-error-request-value-too-long’ (see section
1039 13.1.4.10 in [RFC2911]) when a URI received in a request is too long.

1040 Note: IPPFAX Receivers ought to be cautious about depending on URI lengths above 255 bytes, because
1041 some older client or proxy implementations might not properly support these lengths.

1042 IPPFAX URLs MUST be represented in absolute form. Absolute URLs always begin with a scheme name
1043 followed by a colon. For definitive information on URL syntax and semantics, see “Uniform Resource
1044 Identifiers (URI): Generic Syntax and Semantics” [RFC2396]. This specification adopts the definitions of
1045 “port”, “host”, “abs_path”, and “query” from [RFC2396], as updated by [RFC2732] and [RFC2373] (for
1046 IPv6 addresses in URLs).

1047 The IPPFAX URL scheme syntax in ABNF is as follows:

1048 `ippfax_URL = "ippfax:" "//" host [":" port] [abs_path ["?" query]]`
 1049

1050 If the port is empty or not given, the IANA-assigned port as defined in section 15.2 is assumed. The
 1051 semantics are that the identified resource (see section 5.1.2 of [RFC2616]) is located at the IPPFAX
 1052 Notification Recipient listening for HTTP connections on that port of that host, and the Request-URI for
 1053 the identified resource is 'abs_path'.

1054 Note: The use of IP addresses in URLs SHOULD be avoided whenever possible (see [RFC1900]).

1055 If the 'abs_path' is not present in the URL, it MUST be given as "/" when used as a Request-URI for a
 1056 resource (see section 5.1.2 of [RFC2616]). If a proxy receives a host name which is not a fully qualified
 1057 domain name, it MAY add its domain to the host name it received. If a proxy receives a fully qualified
 1058 domain name, the proxy MUST NOT change the host name.

1059 **15.6 IPPFAX URL Examples**

1060 The following are examples of valid IPPFAX URLs for Notification Recipient objects (using DNS host
 1061 names):

1062 `ippfax://abc.com`
 1063 `ippfax://abc.com/listener`
 1064

1065 Note: The use of IP addresses in URLs SHOULD be avoided whenever possible (see [RFC1900]).

1066 The following literal IPv4 addresses:

1067 `192.9.5.5` ; IPv4 address in IPv4 style
 1068 `186.7.8.9` ; IPv4 address in IPv4 style
 1069

1070 are represented in the following example IPPFAX URLs:

1071 `ippfax://192.9.5.5/listener`
 1072 `ippfax://186.7.8.9/listeners/tom`
 1073

1074 The following literal IPv6 addresses (conformant to [RFC2373]):

1075 `::192.9.5.5` ; IPv4 address in IPv6 style
 1076 `::FFFF:129.144.52.38` ; IPv4 address in IPv6 style
 1077 `2010:836B:4179::836B:4179` ; IPv6 address per RFC 2373
 1078

1079 are represented in the following example IPPFAX URLs:

1080 `ippfax://[::192.9.5.5]/listener`

1111
1112 [jobx]
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1210

1211 IPPFAX Web Page: <http://www.pwg.org/qualdocs/>1212 IPPFAX Mailing List: ifx@pwg.org

1213

1214 To subscribe to the IPPFAX mailing list, send the following email:

1215 1) send it to majordomo@pwg.org

1216 2) leave the subject line blank

1217 3) put the following two lines in the message body:

1218 subscribe ifx

1219 end

1220

1221 Implementers of this specification document are encouraged to join the IPPFAX Mailing List in order
 1222 to participate in any discussions of clarification issues and review of registration proposals for
 1223 additional attributes and values. In order to reduce spam the mailing list rejects mail from non-
 1224 subscribers, so you must subscribe to the mailing list in order to send a question or comment to the
 1225 mailing list.

1226

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1. Appendix A:

1230 **19 Appendix B: vCard Example**1231 **Update the example**

1232 The following ASCII text is a complete vCard v3.0 [RFC2426, RFC2425] example:

```

1233 BEGIN:VCARD
1234 VERSION:3.0
1235 N:Moore;Paul
1236 FN:Paul Moore
1237 ORG:Netreon
1238 TEL;CELL;VOICE:1+206-251-7008
1239 ADR;WORK;;;10900 NE 8th St;Bellvue;WA;98004;United States of America
1240 EMAIL;PREF;INTERNET:pmoore@netreon.com
1241 REV:19991207T215341Z
1242 END:VCARD

```

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1246 **20 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	Updated from the 6/6/01 telecon agreements on most

		Pulera, Ira McDonald	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.

1247

1248

1249 **Allow Cancel-job for Administrators.**1250 **Remove Notifications**1251 **Remove Create-Job, Send-Document, Send-URI, Print-URI.**