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2 **Printer Working Group**
3 **IPP Fax Project**
4 **Standard for IPPFAX/1.0 Protocol**

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16 **Abstract:** This document specifies the IPPFAX/1.0 protocol. The IPPFAX requirements [ifx-req] are derived from the requirements for
17 Internet Fax [RFC2542].
18 In summary, IPPFAX is used to provide a synchronous, reliable exchange of image Documents between clients and servers. The
19 primary use envisaged of this protocol is to provide a synchronous image transmission service for the Internet. Contrast this with the
20 Internet FAX protocol specified in [RFC2305] and [RFC2532] that uses the SMTP mail protocol as a transport.
21 The IPPFAX/1.0 protocol is a specialization of the IPP/1.1 [RFC2911], [RFC2910] protocol supporting a subset of the IPP operations
22 with increased conformance requirements in some cases, some restrictions in other cases, and some additional REQUIRED
23 attributes. The IPPFAX Protocol uses the 'ippfax' URL scheme (instead of the 'ipp' URL scheme) in all its operations. Most of the
24 new attributes defined in this document MAY be supported by IPP Printers as OPTIONAL extensions to IPP as well
25 An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least the PDF/IS as specified in [PWG5102.3-2004] which
26 is defined for the 'application/pdf' document format MIME type. A Print System MAY be configured to support both the IPPFAX and
27 IPP protocols concurrently, but each protocol requires separate Printer objects with distinct URLs.
28

29 This document is available electronically at: [wd-10-20040128.pdf](http://www.ietf.org/internet-drafts/wd-10-20040128.pdf), .doc

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30 A version showing the changes from the previous version is available at: [wd-10-20040128-rev.pdf](http://www.ietf.org/internet-drafts/wd-10-20040128-rev.pdf)

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31 The latest version of this specification is available at: ftp://pwg.org/pub/pwg/QUALDOCS/wd-10-latest.pdf, .doc

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75 standards that define print related protocols, interfaces, procedures and conventions. Printer manufacturers and
76 vendors of printer related software will benefit from the interoperability provided by voluntary conformance to these
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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

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

94

95

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181 1 Introduction

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

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

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

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

197 An IPPFAX Printer object is called a Receiver. A Receiver MUST support at least PDF/is [PWG5102.3-
198 2004] which is defined for the 'application/pdf' document format MIME type. A Print System MAY be
199 configured to support both the IPPFAX and IPP protocols concurrently for a single output device (or
200 multiple output devices), but each protocol requires separate Printer objects with distinct URLs. Note - It
201 is assumed that the reader is familiar with IPP/1.1 [RFC2911], [RFC2910], [RFC3196], and [ipp-iig-bis].

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

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

209 1.1 Operations Supported

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

211

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

226 1.2 Typical exchange

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

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

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

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248 2 Terminology

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

250 2.1 Conformance Terminology

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

258 2.2 Other Terminology

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

261 **IPP Protocol** The protocol defined in [RFC2911] and [RFC2910] and any IPP Protocol Extension
 262 document (see section 16). For the IPP/1.1 Protocol each operation request must use the ‘ipp’ URL
 263 scheme.

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264 **IPPFAX Protocol** The protocol defined in this or a future revision document and any future extension
 265 document. For the IPPFAX Protocol each operation request MUST use the ‘ippfax’ URL scheme (see
 266 section 4.1 and 14). Unless a specific version number is appended to “IPPFAX”, such as “IPPFAX/1.0”,
 267 the term IPPFAX applies to all versions.

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

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

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

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

282 | **IPP Printer object** A Printer object that supports the IPP Protocol and offers the IPP Print Service (by
283 | definition).

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

286 | **Print System** All of the Printer objects on a single managed host network node. A Print System MAY
287 | support IPP and IPPFAX protocols concurrently (see section Q) for a single output device (or multiple
288 | output devices), but each protocol requires separate Printer objects with distinct URLs.

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

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

294 | **Sender** A client that uses the IPPFAX Protocol to query a Receiver and transmit a Document to that
295 | Receiver.

296 | **Document** The electronic representation of a set of one or more pages that the Sender sends to the
297 | Receiver.

298 | **Sending User** The person interacting with the Sender.

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

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

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

302 **PDF/Is** The file format defined by [PWG5102.3-2004].

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

306 3 IPPFAX Model

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

308 3.1 Printer Object Relationships

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

314 3.2 A Printer object with multiple URLs

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

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

323

Deleted: Delivered The Receiver has either printed the Document and delivered the last sheet to the output bin or has forwarded the Document to some other system.¶

Deleted: See also the OPTIONAL “printer-xri-supported” (collection) Printer Description attribute [ipp-set-ops], which, if supported, MUST be used to set these three parallel attributes using the protocol. [ipp-set-ops] and other system administrator operations MUST only be supported if TLS client authentication has been performed and the system administrator role has been confirmed.

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

<#>A Print System supporting both IPP and IPPFAX protocols¶

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

Note: it is possible to support IPP and IPPFAX Printer objects with a single piece of code in a Print System with conditional branching to handle the differences in conformance requirements between IPP and IPPFAX. For example, such conditional branching could (... [1])

324 4 Common IPPFAX Operation Attribute Semantics

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

329 4.1 printer-uri (uri) operation attribute

330 This operation attribute specifies the transfer path to the Receiver for the operation. As in IPP/1.1, the
 331 client MUST supply the “printer-uri” operation attribute in every IPPFAX request (see [RFC2911] section
 332 3.1.5). For IPPFAX, the attribute value MUST be a URL using the ‘ippfax’ scheme (see section 14)
 333 specifying the Receiver’s network location.

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

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

337 As in IPP/1.1 [RFC2911] for each operation, the Receiver NEED NOT validate that the “printer-uri”
 338 operation attribute is present and that the value supplied by the Sender matches one of the Receiver’s
 339 “printer-uri-supported” Printer Description attribute (see section 5.1). For URI matching rules see section
 340 14.7. If the Receiver does validate the “printer-uri” operation attribute and the URI value supplied does not
 341 match any value of the Receiver’s “printer-uri-supported” Printer Description attribute, the Receiver
 342 MUST reject the request, return the ‘client-error-attributes-or-values-not-supported’ status code, and return
 343 the attribute and value in the Unsupported Attributes Group.

344 4.2 version-number parameter

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

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

350

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Deleted: [ipp-ntfy], [ipp-get-method], [ipp-set-ops], etc.

Deleted: ([RFC2911] section 3.1.5)

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Deleted: As in all URLs, the scheme identifies the protocol. For example, if a client supports both the IPP and IPPFAX protocols, then the URL scheme in the “printer-uri” operation attribute that the client supplies indicates the protocol and determines whether the client intends the Print System to use IPP or IPPFAX semantics. Similarly, if a Print System supports both the IPP and IPPFAX protocols, then the URL scheme in the target “printer-uri” operation attribute that the client supplies MUST determine the protocol, the Printer object, and the semantics that the Print System performs.

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Deleted: ([RFC2911] section 3.1.8)

Deleted: the IPP “version-number” parameter MUST be

Deleted: The value is represented as 0x0101 (see [RFC2910]) where the major version number comes first (so-called “network byte order”).

Deleted: If the Receiver does not support the supplied IPP major version as part of the IPPFAX protocol, the Receiver MUST respond as specified in [RFC2911] section 3.1.8 with the ‘server-error-version-not-supported’ status code. As in IPP/1.1, if the major version number is supported, but the minor version number is not, the Receiver SHOULD accept and attempt to perform the request (or reject the request if the operation is not supported), else the Receiver MUST reject the request and returns the ‘server-error-version-not-supported’ status code. In all cases as in IPP/1.1, the Receiver MUST return the “version-number” parameter with the value that it supports that is closest to the version number supplied by the client in the “version-number” parameter in the request.

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351 **4.3 ippfax-version (type2 keyword) operation attribute**

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

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

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

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

365 **5 IPPFAX Printer Description Attributes**

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

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

370 All Printer Description attributes not listed in Table 1 have the same conformance requirements as defined
371 in IPP/1.1 [RFC2911] or other IETF or PWfx@pwg.org standards track IPP documents.

372 See section 8.2 for the Receiver conformance requirements for the “xxx-supported”, “xxx-default”, and
373 “xxx-ready” Job Template Printer attributes.

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Deleted: If the Sender does not supply this attribute, the Receiver MUST reject the operation, MUST return the ‘client-error-bad-request’ status code, and SHOULD return the ‘ippfax-version attribute name keyword in the Unsupported Attributes Group (see section Error! Reference source not found). ¶

Deleted: the “ippfax-version” operation attribute MUST be ‘1.0’ keyword value

Deleted: By including an IPPFAX version number in the client request, it allows the Sender to identify which version of IPPFAX the Sender is requesting to be used, i.e., the version whose conformance requirements the Sender may be depending upon the Receiver to meet.

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Deleted: As in IPP/1.1, if the Receiver does not support the major version number supplied by the Sender, i.e., the major version field of the “ippfax-version” operation attribute does not match any of the values of the Printer’s “ippfax-versions-supported” (see section 6.3), the Receiver MUST respond with a status code of ‘server-error-version-not-supported’ along with the closest version number that is supported (see [RFC2911] section 13.1.5.4). If the major version number is supported, but the minor version number is not, the Receiver SHOULD accept and attempt to perform the request (or reject the request if the operation is not supported), else it (... [2]

Deleted: <#>Get-Printer-Attributes operation semantics¶ (... [3]

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Deleted: Any other Printer Description attributes defined in other docume (... [4]

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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	5.1 Error! Reference source not found.
ipp-versions-supported (1setOf type2 keyword) *	must	MUST***	5.2
ippfax-versions-supported (1setOf type2 keyword)	MUST NOT	MUST***	5.3
operations-supported (1setOf type2 enum) *	must	MUST	5.4
document-format-supported (1setOf mimeType) *	must	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	MUST	5.8

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

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

379 *** A Printer object that supports IPPFAX MUST NOT support IPP as well, but MUST support the “ipp-
380 versions-supported” attribute to indicate the version(s) of IPP that are supported *as part of IPPFAX*
381 *operations*. A Print System that supports both IPP and IPPFAX MUST support them as separate
382 Printer objects (see section [Q](#)).

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383 **5.1 printer-uri-supported (1setOf uri) ([RFC 2911] section 4.4.1)**

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

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

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

395 The Receiver MUST support the ‘ippfax’ URL scheme (see section 14) and only the ‘ippfax’ URL scheme
396 for this attribute (see section Q).

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397 **5.2 ipp-versions-supported (1setOf type2 keyword) ([RFC2911] section 4.4.14)**

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

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

405 ‘1.1’: The “IPP part” of the IPPFAX operations meets the protocol and encoding conformance
406 requirements of IPP version 1.1 as specified in [RFC2911], [RFC2910], and IPP extensions.

407
408 Note: As in [RFC2911] section 4.4.14, these version keyword values violate the syntax for
409 keywords, by starting with an ASCII digit, instead of an ASCII lower case letter.

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410 **5.3 ippfax-versions-supported (1setOf type2 keyword)**

411 This attribute identifies the version or versions of the IPPFAX Protocol that this Receiver supports,
412 including major and minor versions, i.e., the version numbers for which this Receiver meets the
413 conformance requirements. The support of this attribute indicates that this Printer object is a Receiver as
414 opposed to an IPP Printer object. The Receiver MUST support this Printer Description attribute. An IPP
415 Printer object MUST NOT support this attribute, since a Printer object MUST NOT support both IPP and
416 IPPFAX (see section Q).

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

420 Since a Printer object MUST NOT support both the IPP and IPPFAX protocols, there is no ambiguity with
421 requiring a Receiver to support both the “ipp-versions-supported” and “ippfax-versions-supported” Printer
422 Description attributes (see sections 5.2 and 5.3). If a Printer object supports the “ipp-versions-supported”
423 attribute, but not the “ippfax-versions-supported” attribute, then by definition that Printer object supports

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

428 Standard keyword values are:

429 ‘1.0’: Meets the conformance requirements of IPPFAX version 1.0 as specified in this document.

430

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

435 **5.4 operations-supported (1setOf type2 enum) ([RFC 2911] section 4.4.15)**

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

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

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

443 **5.5 document-format-supported (1setOf mimeType) ([RFC 2911] section 4.4.22)**

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

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

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

450 **5.6 document-format-version-supported (1setOf text(127))**

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

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

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

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456 **5.7 digital-signatures-supported (1setOf type2 keyword)**

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

459 Digital-signature and digital-signature-supported will move to [jobX] specification. Reference them from
460 that specification

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

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463 **5.8 pdl-override-supported (type2 keyword)**

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

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

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

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471 **6 Sender Validation of the Receiver’s Capabilities**

472 This section describes how a Sender MUST first validate the target Printer as a Receiver and determines its
473 basic capabilities (section [6.1](#)) and then validate the IPPFAX Job (section **Error! Reference source not**
474 **found.**).

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475 NOTE: This WHOLE section needs revision and possible wholesale deletion

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476 **6.1 Sender Validates the target Printer as a Receiver and determines its basic capabilities**

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

480

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	<u>5.3</u>	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.
document-format-version-supported	<u>5.6</u>	If the Sender would like to use a document format other than PDF/is, then the Sender MUST verify that the desired version of PDF is supported by the Receiver..
Job Template Printer attributes:		
media-supported	<u>8.2.1.1</u>	If the Sending user requests a paper size other than iso_a4_210x297mm or na_letter_8.5x11in then the Sender MUST verify that the requested paper size is supported by the receiver
printer-resolutions-supported	Error! Reference source not found.	Sender SHOULD check which resolutions are supported, so that it can use the highest resolution supported by the Receiver.

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481

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482

7 Identity exchange

483

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

484

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

485

486

487 **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

488 * Sender supplies in a Print-Job,operation.

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489 **7.1 sending-user-vcard (text(MAX)) operation/Job Description attribute**

490 This operation attribute identifies the Sending User in MIME vCard v3.0 [RFC2426, RFC2425] format.
 491 The Sender MAY send this operation attribute in an IPPFAX Print-Job operation. The Receiver MUST
 492 support this Print-Job operation attribute according to the vCard v3.0 specification and MUST populate the
 493 job's corresponding Job Description attribute. The Receiver MUST support MAX (1023) octets of text.
 494 However, the Receiver MAY ignore any image, logo, and sound parts, in which case it MUST still accept
 495 the Print-Job request and return the 'successful-ok-ignored-or-substituted-attributes' status code (see
 496 [RFC2911] section 13.1.2.2), but NEED NOT return the attribute and its ignored values in the Unsupported
 497 Attributes Group.

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

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

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507 **7.2 receiving-user-vcard (text(MAX)) operation/Job Description attribute**

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

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

517 The Receiver MAY choose to use this information on a job start and end sheet (banner page) for the job.
518 See discussion under section [7.1](#).

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519 **[7.3](#) sender-uri (uri) operation/Job Description attribute**

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

525 The Sender MUST send this operation attribute with the configured value in an IPPFAX Print-Job
526 operation. The Receiver MUST support this Print-Job operation attribute and MUST populate the job's
527 corresponding Job Description attribute.

528 The Receiver MUST use its value to populate the Job object's corresponding Job Description attribute of
529 the same name. This value is only a comment (since it can be spoofed) and is used for logging purposes
530 and has nothing to do with authentication (for which, see section [10](#)). This attribute is more akin to an
531 email 'Reply-To' field.

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532 **[8](#) Submission using Print-Job**

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

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537 **[8.1](#) IPP/1.1 Print-Job operation attributes**

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

541

Table 4 - [RFC 2911] 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) *	8.1.1	MUST with 'true' value ¹	must	MUST
document-name (name(MAX)) *		MAY	must	MUST
compression (type3 keyword) *		MAY	must	MUST
document-format (mimeMediaType) *	8.1.2	MUST ²	must	MUST
document-format-version (type2 keyword)	8.1.3	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))	7.1	MAY ³	may	MUST
receiving-user-vcard (text(MAX))	7.2	SHOULD ³	may	MUST
sender-uri (name(MAX))	7.3	MUST ³	may	MUST

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

542
543

544 **8.1.1 ipp-attribute-fidelity operation attribute ([RFC2911] section 3.2.1.1)**

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

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].

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

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

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554 **8.1.2 document-format (mimeType) operation attribute ([RFC2911] section 3.2.1.1)**

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

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

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

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564 **8.1.3 document-format-version (type2 keyword) operation attribute ([RFC2911] section 565 3.2.1.1)**

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

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

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

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

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575 Standard keyword values are defined in section 5.6.

576 **8.2 Job Template Attributes (for Print-Job)**

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

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

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

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

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

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

606

607

608

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 8.2.1)		[RFC2911]
multiple-document-handling (type2 keyword)	MUST NOT	No multiple document jobs	[RFC2911]
number-up (integer(1:MAX))	MUST NOT	1	[RFC2911]
orientation-requested (type2 enum)	MUST NOT		[RFC2911]
page-ranges (1setOf rangeOfInteger(1:MAX))	MUST NOT	1:MAX	[RFC2911]
print-quality (type2 enum)	MUST NOT	Administrator's choice	[RFC2911]
printer-resolution (resolution)	MUST NOT (see section Error! Reference source not found.)		[RFC2911]
sides (type2 keyword)	MUST NOT	Administrator's choice	[RFC2911]

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609
610

8.2.1 media (type2 keyword | name(MAX)) Job Template attribute ([RFC2911] section 4.2.11)

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611
612
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614

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

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616

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

617 At a minimum, an IPPFAX receiver MUST be able to render the sizes ‘na_letter_8.5x11in’
 618 ‘iso_a4_210x297mm’ and be able to print on at least one of those two sizes. The Receiver MAY
 619 scale down at most 10% (PDF/is directives may prohibit this scaling), overflow to another page, or
 620 truncate. If the Receiver does truncate then it MUST notify the Receiving User. Any scaling
 621 performed MUST be isomorphic.
 622 PDF Crop boxes SHOULD be used when the Sender knows that the imageable region is less than the
 623 media size. If the crop box is the union of the lesser size of iso_a4_210x297mm and na_letter_8.5x11in
 624 minus ¼ of an inch, then the Sender can be sure that the majority of Receivers can print the complete image
 625 without loss of data. However, this does mean that there is the possibility that data may lost.
 626

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627 Standard keyword values are defined in section 9.2.1.1.

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628 **8.2.1.1 media-supported Job Template Printer attributes**

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

631 ‘na_letter_8.5x11in’
 632 ‘iso_a4_210x297mm’
 633 ‘choice_iso_a4_210x297mm_na_letter_8.5x11in’ - represents both ‘na_letter_8.5x11in’ and
 634 ‘iso_a4_210x297mm’ and indicates that either is acceptable. See [jobx].

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635 **8.3 Delivery Confirmation using the Print-job response**

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

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640 **8.4 Originator identifier image**

641 The Sender MUST place an originator identifier, i.e., the value of the “sender-uri” attribute (see section
 642 7.3), along with the date and time, in one of the following places, DEPENDING ON
 643 IMPLEMENTATION:

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

647 3. At the top of every page of the sent Document.
 648 The Sender MAY include additional data (Sending User, Receiver identity, etc.).

649 Reference PDF/is method.

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650 **9 IPPFAX Implementation of other IPP operations**

651 Other IPP operations? I think not!

652 Section 4 defined the semantic requirements for the Get-Printer-Attributes operation, section 6 defined the
 653 semantic requirements for Validate-Job, and section 8 defined the semantic requirements for Print-Job
 654 operations for IPPFAX. This section defines the IPPFAX semantics and conformance requirements for the
 655 other IPP operations.

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656 IPPFAX restricts the use of IPP in certain cases in order to make attaching a Receiver to the Internet a safe
 657 option – see section 10.

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

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

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664 **9.1 Operation Conformance Requirements**

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

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

680 | **MAY*** - Get-Job-Attributes restricts certain. See section [9.3](#).
 681 | **Owner** refers to the owner of the Job or Subscription object.

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682 | **9.2 Cancel-Job operation**

683 | **Only Operators/Administrators can cancel IPPFax jobs.**

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684 | **9.3 Get-Job-Attributes and Get-Jobs operations**

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

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

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

691 | job-id, job-uri
 692 | job-k-octets, job-k-octets-completed
 693 | job-media-sheets, job-media-sheets-completed,
 694 | time-at-creation, time-at-processing
 695 | job-state, job-state-reasons
 696 | **number-of-intervening-jobs – NOT!!!!**

697 |
 698 | The exact choice of Job attributes that a client can query for IPPFAX Jobs, including not returning any,
 699 | **DEPENDS ON IMPLEMENTATION** and the security policy in force and is outside the scope of this
 700 | standard (as in IPP/1.1).

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

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

705 | An IPP administrator MAY read all attributes.

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706 | **10 Security considerations**

707 | **IPPFAX presents an interesting challenge of balancing security and openness.** Many of the envisaged uses
 708 | of IPPFAX require confidentiality of the data – at the same time the Receiver typically has no prior

709 knowledge of the Sender or the Sending User. This last point will normally rule out all user-based
710 authentication and access control. This is the reason for the restrictions placed on querying and canceling
711 IPPFAX Jobs.

712 **10.1 Data Integrity and authentication**

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

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

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

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

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

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

726 **10.2 Data Privacy (encryption)**

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

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728 **10.3 uri-authentication-supported (1setOf type2 keyword) ([RFC2911] section 4.4.2)**

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

731 **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

732 * TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA mandated by [RFC2246].

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

735 **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

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737 **10.4 uri-security-supported (1setOf type2 keyword) ([RFC2911] section 4.4.3)**

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

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740 **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

741

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

744 **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

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

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

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

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

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753 **10.5 Using IPPFAX with TLS**

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

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

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

- 764 IPP/1.1 sequence:
- 765 1. Start TCP connection
 - 766 2. Zero or more HTTP/IPP requests
 - 767 3. HTTP/IPP request with Upgrade to TLS header
 - 768 4. TLS handshake
 - 769 5. Finish the HTTP/IPP request securely
 - 770 6. Send more HTTP/IPP requests securely ...

- 771
- 772 IPPFAX sequence:
- 773 1. Start TCP connection
 - 774 2. Send TLS ClientHello
 - 775 3. Rest of TLS handshake
 - 776 4. Send HTTP/IPPFAX requests securely ... (which usually will be a Get-Printer-Attributes,
 - 777 followed by the Print-Job operation).
 - 778

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779 **10.6 Access control**

780 Needs re-writing

781 It is expected that the majority of IPPFAX Receivers will operate in a public mode when operating on the
 782 Internet, so that anonymous users can send documents without requiring client authentication
 783 (corresponding to the 'none' value for the "uri-authentication-supported" attribute - see section 10.3).
 784 However a Receiver MAY protect itself using any Client Authentication method specified in [RFC2911]
 785 (digest authentication [RFC2069] for example) to restrict access to any or all of its functionality.

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

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788 **10.7 Reduced feature set**

789 Needs re-writing

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

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

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

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798 **11 Attribute Syntaxes**

799 No new attribute syntaxes are defined.

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800 **12 Status codes**

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

802 .

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803 **13 Conformance Requirements**

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

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

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

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

813 3. The Receiver MUST support the Get-Printer-Attributes operation as described in sections **1**.

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

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815 **5. The Sender MUST validate that the target Printer is IPPFAX-capable using the Get-Printer-**
816 **Attributes operation and validate that the Receiver supports the job using the Validate-Job operation**
817 **as specified in section 6.**

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818 6. The Sender MUST supply and the Receiver MUST support the operation/Job Description attributes
819 for Identify Exchange as described in section **7**.

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820 7. The Sender MUST support submitting and the Receiver MUST accept IPPFAX Jobs as defined in
821 section 8.

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

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

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825 10. The Sender and Receiver MUST support the security mechanisms indicated in section 10, including
826 TLS.

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

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829 **14 IPPFAX URL Scheme**

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

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

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

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834 **14.1 IPPFAX URL Scheme Applicability and Intended Usage**

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

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

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

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843 **14.2 IPPFAX URL Scheme Associated IPPFAX Port**

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

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

847 **14.3 IPPFAX URL Scheme Associated MIME Type**

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

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

852 **14.4 IPPFAX URL Scheme Character Encoding**

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

859 **14.5 IPPFAX URL Scheme Syntax in ABNF**

860 The IPP protocol places a limit of 1023 octets (NOT characters) on the length of a URI (see section 4.1.5
861 ‘uri’ in [RFC2911]). An IPPFAX Receiver MUST return ‘client-error-request-value-too-long’ (see section
862 13.1.4.10 in [RFC2911]) when a URI received in a request is too long.

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

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

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

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

872

873 If the port is empty or not given, the IANA-assigned port as defined in section 14.2 is assumed. The
874 semantics are that the identified resource (see section 5.1.2 of [RFC2616]) is located at the IPPFAX

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

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

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

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882 **14.6 IPPFAX URL Examples**

883 The following are examples of valid IPPFAX **URLs for Notification Recipient** objects (using DNS host
884 names):

```
885     ippfax://abc.com
886     ippfax://abc.com/listener
```

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

889 The following literal IPv4 addresses:

```
890     192.9.5.5           ; IPv4 address in IPv4 style
891     186.7.8.9           ; IPv4 address in IPv4 style
```

892 are represented in the following example IPPFAX URLs:

```
894     ippfax://192.9.5.5/listener
895     ippfax://186.7.8.9/listeners/tom
```

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

```
898     ::192.9.5.5         ; IPv4 address in IPv6 style
899     ::FFFF:129.144.52.38 ; IPv4 address in IPv6 style
900     2010:836B:4179::836B:4179 ; IPv6 address per RFC 2373
```

901 are represented in the following example IPPFAX URLs:

```
903     ippfax://[::192.9.5.5]/listener
904     ippfax://[::FFFF:129.144.52.38]/listener
905     ippfax://[2010:836B:4179::836B:4179]/listeners/tom
```

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907 **14.7 IPPFAX URL Comparisons**

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

- 910 • A port that is empty or not given MUST be treated as equivalent to the port as defined in section
 911 [14.2](#) for that IPPFAX URL;

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912 **15 IANA Considerations**

913 IANA shall register the ippfax URL scheme as defined in section [14](#), according to the procedures of
 914 [RFC2717] and assign a well known port.

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915 Operation Attributes:

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

917 Operation/Job Description attributes:

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

IEEE-ISTO 510n.y [7.1](#)

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

IEEE-ISTO 510n.y [7.2](#)

Deleted: 8.2

920 sender-uri (uri)

IEEE-ISTO 510n.y [7.3](#)

Deleted: 8.3

921 Printer Description Attributes:

922 ippfax-versions-supported (1setOf type2 keyword) IEEE-ISTO 510n.y [5.3](#)

Deleted: 6.3

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Contact Information:

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

1035

IPPFAX Mailing List: ifx@pwg.org

1036

1037

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

1038

1) send it to majordomo@pwg.org

1039

2) leave the subject line blank

1040 3) put the following two lines in the message body:

1041 subscribe ifx
1042 end

1043
1044 Implementers of this specification document are encouraged to join the IPPFAX Mailing List in order
1045 to participate in any discussions of clarification issues and review of registration proposals for
1046 additional attributes and values. In order to reduce spam the mailing list rejects mail from non-
1047 subscribers, so you must subscribe to the mailing list in order to send a question or comment to the
1048 mailing list.

1049 Other Participants:
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1051 1. Appendix A:
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18 Appendix B: vCard Example

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1054

Update the example

1055

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

1056

BEGIN:VCARD

1057

VERSION:3.0

1058

N:Moore;Paul

1059

FN:Paul Moore

1060

ORG:Netreon

1061

TEL;CELL;VOICE:1+206-251-7008

1062

ADR;WORK;;;10900 NE 8th St;Bellvue;WA;98004;United States of America

1063

EMAIL;PREF;INTERNET:pmoore@netreon.com

1064

REV:19991207T215341Z

1065

END:VCARD

1066

1067

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19 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	Dennis Carney	Editorial updates

	05/28/03	Tom Hastings	Added new 'choice_iso_a4_210x297mm_na_letter_8.5x11in' value for "media" and a reference to [jobx]. Fixed conformance for "media-ready".
18	10/03 11/03	Gail Songer	Reviewed in light of the Requirements specification. Noted lots of places in which the document MUST be changed.

1069

1070

Allow Cancel-job for Administrators.

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

3.3A Print System supporting both IPP and IPPFAX protocols

From section 3.2, if a Print System supports both IPP and IPPFAX, it MUST do so with separate Printer objects, not with a single Printer object with IPP and IPPFAX URLs. Each such Printer object MUST support either IPP or IPPFAX, but not both. In other words, each URL for a Printer object MUST have the same scheme, namely, ‘ipp’ or ‘ippfax’, i.e., MUST NOT have some URLs with the ‘ipp’ scheme and other URLs with the ‘ippfax’ scheme. The reason for this requirement for separate Printer objects for IPP and IPPFAX is because a URL and its Printer object is intended to represent a network resource offering a particular type of service, not several different types of services. Note: it is possible to support IPP and IPPFAX Printer objects with a single piece of code in a Print System with conditional branching to handle the differences in conformance requirements between IPP and IPPFAX. For example, such conditional branching could depend on the “printer-uri” operation attribute supplied by the client in each request to the Print System. See section 1 for a comparison of IPP/1.1 and IPPFAX/1.0.

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

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

5 Get-Printer-Attributes operation semantics

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

5.1 document-format (mimeMediaType) operation attribute ([RFC2911] section 3.2.5.1)

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

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

Any other Printer Description attributes defined in other documents are OPTIONAL for IPPFAX.