

1 INTERNET-DRAFT 7 ISSUES are highlighted like this.
2 <draft-ietf-ipp-notify-mailto-00.txt>

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March 9, 2000

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8 Internet Printing Protocol (IPP):
9 **The 'mailto:' Notification Delivery Method**

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12 Status of this Memo

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21 **Abstract**

22 The IPP notification specification [ipp-ntfy] is an OPTIONAL extension to IPP/1.0 and IPP/1.1 that
23 requires the definition of one or more delivery methods for dispatching event notification reports to
24 Notification Recipients. This document describes the semantics and syntax of the 'mailto:' event
25 notification delivery method. For this delivery method, the IPP Printer uses the SMTP mail protocol to
26 send (push) Human Consumable and/or Machine Consumable Notifications to Notification Recipients.
27 The Subscriber specifies the mail address using the mailto: URL. This mail address can be any user or can
28 be any of the mail services defined to perform such notification using parameters in the URL, such as
29 paging. The Subscriber can specify the MIME media type of both the Human Consumable and Machine
30 Consumable Notifications. The Subscriber can also specify a mail address in the "subscriber-user-data"
31 Subscription attribute to which the Notification Recipient can reply and to which the mail system delivers
32 undeliverable mail messages. That mail address is usually the Subscribers mail address, but can be any
33 mail address.

34 The mail messages appear to come from the Printer, so that mail agents can sort and filter on the From:
35 field. Also the beginning of the Subject line starts with the localized "Printer message: " prefix, so that mail
36 agents can filter from any Printer.

37 The full set of IPP documents includes:

- 38 Design Goals for an Internet Printing Protocol [RFC2567]
- 39 Rationale for the Structure and Model and Protocol for the Internet Printing Protocol [RFC2568]
- 40 Internet Printing Protocol/1.1: Model and Semantics [ipp-mod]
- 41 Internet Printing Protocol/1.1: Encoding and Transport [ipp-pro]
- 42 Internet Printing Protocol/1.1: Implementer's Guide [ipp-iig]
- 43 Mapping between LPD and IPP Protocols [RFC2569]
- 44 Internet Printing Protocol (IPP): Event Notification Specification [ipp-ntfy]

45

46 The "Design Goals for an Internet Printing Protocol" document takes a broad look at distributed printing
47 functionality, and it enumerates real-life scenarios that help to clarify the features that need to be included
48 in a printing protocol for the Internet. It identifies requirements for three types of users: end users,
49 operators, and administrators. It calls out a subset of end user requirements that are satisfied in IPP/1.0. A
50 few OPTIONAL operator operations have been added to IPP/1.1.

51 The "Rationale for the Structure and Model and Protocol for the Internet Printing Protocol" document
52 describes IPP from a high level view, defines a roadmap for the various documents that form the suite of
53 IPP specification documents, and gives background and rationale for the IETF working group's major
54 decisions.

55 The "Internet Printing Protocol/1.1: Model and Semantics" document describes a simplified model with
56 abstract objects, their attributes, and their operations that are independent of encoding and transport. It
57 introduces a Printer and a Job object. The Job object optionally supports multiple documents per Job. It
58 also addresses security, internationalization, and directory issues.

59 The "Internet Printing Protocol/1.1: Encoding and Transport" document is a formal mapping of the abstract
60 operations and attributes defined in the model document onto HTTP/1.1 [RFC2616]. It defines the
61 encoding rules for a new Internet MIME media type called "application/ipp". This document also defines
62 the rules for transporting over HTTP a message body whose Content-Type is "application/ipp". This
63 document defines a new scheme named 'ipp' for identifying IPP printers and jobs.

64 The "Internet Printing Protocol/1.1: Implementer's Guide" document gives insight and advice to
65 implementers of IPP clients and IPP objects. It is intended to help them understand IPP/1.1 and some of the
66 considerations that may assist them in the design of their client and/or IPP object implementations. For
67 example, a typical order of processing requests is given, including error checking. Motivation for some of
68 the specification decisions is also included.

69 The "Mapping between LPD and IPP Protocols" document gives some advice to implementers of gateways
70 between IPP and LPD (Line Printer Daemon) implementations.

71 The "Event Notification Specification" document extends the Job Creation operations and defines
72 additional operations that allow a client to subscribe to printing related events. Subscriptions are modeled
73 as Subscription objects which can be Per-Job or Per-Printer Subscriptions. Additional operations are
74 defined to query, renew, and cancel Subscription objects.

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111 1 Introduction

112 An IPP Printer that supports the OPTIONAL IPP notification extension [ipp-ntfy] is called a Notification
113 Source which sends event Notifications to Notification Recipients. As such, a Printer either a) accepts,
114 stores, and uses notification Subscription objects to generate event Notification reports and implement one
115 or more delivery methods for notifying interested parties, or b) supports a subset of these tasks and farms
116 out the remaining tasks to a Notification Delivery Service. This document describes the semantics and
117 syntax of the 'mailto:' event notification delivery method. Such a Notification Delivery Service then
118 delivers the event Notification to the Ultimate Notification Recipient.

119 For this delivery method, the IPP Printer uses the SMTP mail protocol to send (push) Human Consumable
120 and/or Machine Consumable Notifications to Notification Recipients. The Subscriber specifies the mail
121 address using the mailto: URL. This mail address can be any user or can be any of the mail services
122 defined to perform such notification using parameters in the URL, such as paging. The Subscriber can
123 specify the MIME media type of both the Human Consumable and Machine Consumable Notifications.
124 The Subscriber can also specify a mail address in the "subscriber-user-data" Subscription attribute to which
125 the Notification Recipient can reply and to which the mail system delivers undeliverable mail messages.
126 That mail address is usually the Subscribers mail address, but can be any mail address.

127 The mail messages appear to come from the Printer, so that mail agents can sort and filter on the From:
128 field. Also the beginning of the Subject line starts with the localized "Printer message: " prefix, so that mail
129 agents can filter from any Printer.

130 2 Terminology

131 This section defines terminology used throughout this document:

132 2.1 Conformance Terminology

133 Capitalized terms, such as **MUST**, **MUST NOT**, **REQUIRED**, **SHOULD**, **SHOULD NOT**, **MAY**,
134 **NEED NOT**, and **OPTIONAL**, have special meaning relating to conformance to this specification.
135 These terms are defined in [ipp-mod section 13.1 on conformance terminology, most of which is
136 taken from RFC 2119 [RFC2119].

137 **REQUIRED** - an adjective used to indicate that a conforming IPP Printer implementation **MUST**
138 support the indicated operation, object, attribute, attribute value, status code, or out-of-band value in
139 requests and responses. See [ipp-mod] "Appendix A - Terminology for a definition of "support".
140 *Since support of this entire notification specification is OPTIONAL for conformance to IPP/1.0*
141 *or IPP/1.1, the use of the term REQUIRED in this document means "REQUIRED if this*
142 *OPTIONAL notification specification is implemented".*

143 **OPTIONAL** - an adjective used to indicate that a conforming IPP Printer implementation **MAY**, but is
144 **NOT REQUIRED** to, support the indicated operation, object, attribute, attribute value, status code,
145 or out-of-band value in requests and responses.

146 2.2 Other terminology

- 147 Event Notification (Notification for short) - See [ipp-ntfy]
- 148 Notification Source - See [ipp-ntfy]
- 149 Notification Recipient - See [ipp-ntfy]
- 150 Subscription object - See [ipp-ntfy]
- 151 Ultimate Notification Recipient - See [ipp-ntfy]

152 3 Model and Operation

153 In the IPP Notification Model [ipp-ntfy], a client is able to:

- 154 1. supply one or more Per-Job Subscriptions in the Job Creation operation
- 155 2. OPTIONALLY supply Per-Job Subscriptions as subsequent Create-Job-Subscription operations
- 156 3. supply one Per-Printer Subscription in the Create-Printer-Subscription operation. The client that
157 creates these Subscription objects becomes the owner of the Subscription object.

158 The client that creates these Subscription objects becomes the owner of the Subscription object.

159 When creating each Subscription object, the client supplies the "notify-recipient" (uri) attribute. The
160 "notify-recipient" attribute specifies both a single Notification Recipient that is to receive the Notifications
161 when subsequent events occur and the method for Notification delivery that the IPP Printer is to use. For
162 the 'mailto:' Notification delivery method defined in this document, the "notify-recipient" consists of the
163 'mailto:' scheme followed by an SMTP mail address [RFC822].

164 Notification Sources that implement the 'mailto:' event notification delivery method will need to include an
165 SMTP mail agent while Notification Recipients that implement this delivery method will need to support an
166 SMTP server. **ISSUE 01: Is this SMTP terminology correct?**

167 The IPP Printer can be the Notification Source or could use some other Notification Delivery Service that
168 actually delivers the mail message. In this latter case, the protocol between the IPP Printer and the
169 Notification Delivery Service is implementation defined and could be the INDP protocol (see [indp]).

170 Also the Notification Recipient specified by the "notify-recipient" Subscription attribute can be either (1)
171 the Ultimate Notification Recipient or can be a Notification Delivery Service, such as a paging system that
172 accept 'mailto:' parameters to indicate the Ultimate Notification Recipient, such as a phone number or
173 paging subscriber's id.

174 14 Sending Notifications

175 This section defines the processing that the IPP Printer MUST perform when sending an event Notification
176 using the 'mailto:' delivery method. The usage of each of the Subscription object attributes defined in [ipp-
177 ntfy] is described here as it applies to the 'mailto:' delivery method. The description of each Subscription

178 attribute in this document is not the complete description, but is just the application of the attribute to this
179 'mailto:' delivery method. See the complete definition of each Subscription object attribute in [ipp-ntfy].
180 **ISSUE 02: Is it a good idea to list each Subscription object attribute in this spec with the applicability to**
181 **this delivery method? If yes, should all delivery method specs also do it this way?** Section 5 defines how
182 the IPP Printer populates the SMTP fields in the mail message.

183 **4.1 notify-recipient (uri)**

184 This REQUIRED READ-ONLY Subscription object attribute contain the 'mailto:' URI delivery method
185 followed by the SMTP mail address [RFC821] of the Notification Recipient. As required by the [ipp-ntfy]
186 document, the following information is given for this notification delivery method:

187 **ISSUE 03 - What should we say about any mailto parameters, if any? For example, if you want to send**
188 **over secure mail, etc.**

189 **ISSUE 04 - Do we want to define any IPP-specific mailto parameters to this document?**

190 **4.2 notify-events (1setOf type2 keyword)**

191 This REQUIRED READ-ONLY Subscription object attribute identifies the job and/or printer events that
192 are to be delivered to the Notification Recipient as Notifications as defined in [ipp-ntfy] section 7.

193 Note: Some rapidly recurring events, such as page events, are not appropriate to use with this delivery
194 method, especially if the recipient mail address is a mailing list. Implementations MAY choose either not
195 to support page events with the 'mailto:' delivery method and/or not permit a mailing list to be supplied, if
196 they can detect that a mail address is a mailing list.

197 **4.3 notify-format (mimeMediaType)**

198 This REQUIRED READ-ONLY Subscription object attribute indicates the type of Human Consumable
199 and/or Machine Consumable format content that is to be sent in the Notifications as a mail message
200 attachment. For the 'mailto:' delivery method, any registered 'mimeMediaType' value is allowed, including
201 types that allow pictures to be represented, e.g., 'application/postscript' or 'image/tiff', and/or sounds to be
202 represented, e.g., 'audio/32kadpcm'. The body of the mail message MUST always be 'text/plain;
203 charset=us-ascii, since that is the default for 'mailto:'.

204 There is no "notify-default" Printer attribute to configure. If the client did not supply the "notify-format"
205 attribute in the Subscription Creation operation, the Printer MUST populate this attribute with an
206 implementation-defined default value. Such a default value MAY include multi-part mixed media, so that
207 the Printer can send multi-part mixed MIME type attachments by default (though there is no way for the
208 client to explicitly request such). If the out-of-band 'none' value [ipp-col] was supplied in the Subscription
209 Creation operation, the Printer MUST NOT send any attachment in the Notification.

210 If the MIME media type registration definition permits a charset parameter, than the client MUST use such
211 a specification (instead of the "notify-charset" attribute) in order to indicate the charset to be used in the
212 Notification content.

213 **4.4 subscriber-user-data (octetString(63))**

214 This REQUIRED READ-ONLY Subscription object attribute holds an SMTP mail address value that the
215 Printer copies to the "From:" inside <> (see RFC 822 [rfc822] section 4.4.1) and the "Sender:" SMTP fields
216 (see section 5). For the 'mailto:' notification delivery method, the client MUST supply the "subscriber-user-
217 data" attribute. If the client omits this attribute, the Printer MUST either (1) reject the operation with the
218 'client-error-bad-request' or (2) ignore this Subscription, since the Printer will not have a mail address to put
219 in the "From:" and in the "Sender:" SMTP fields, depending on implementation.

220 When the subscribing user selects the 'mailto:' delivery scheme, the client SHOULD obtain the user's mail
221 address automatically from the client system (in an implementation-dependent manner) and supply it as the
222 value of the "subscriber-user-data" attribute by default, rather than require the user to explicitly supply it.
223 Allowing users to supply the mail address explicitly would allow the malicious user to hide his/her identity
224 when sending notifications by email.

225 **4.5 notify-charset (charset)**

226 This OPTIONAL READ-ONLY Subscription object attribute specifies the charset to be used in the
227 Notification content sent to the Notification Recipient, whether the notification content is Machine
228 Consumable or Human Consumable. The client MUST NOT supply and the Printer MUST NOT use this
229 attribute when the MIME media type registration definition supplied in the "notify-format" attribute value
230 allows the charset parameter in its MIME media type value, e.g., 'text/plain; charset=utf-8'.

231 **4.6 notify-natural-language (naturalLanguage)**

232 This OPTIONAL READ-ONLY Subscription object attribute specifies the natural language for the IPP
233 object to use in the localized Notification content that is sent to the Notification Recipient, whether the
234 notification content is Machine Consumable or Human Consumable.

235 **4.7 request-id**

236 This REQUIRED READ-ONLY Subscription object attribute holds the most recent request-id sequence
237 number delivered in a Notification content to the Notification Recipient. A value of 0 indicates that no
238 Notifications have been sent for this subscription. The first request-id sent for a subscription MUST be 1.
239 Each Notification Recipient has its own monotonically increasing series of request-ids, i.e., no gaps, in
240 order to be able to detect a missing notification.

241 **4.8 subscription-id (integer (1:MAX))**

242 This REQUIRED READ-ONLY Subscription object attribute uniquely identifies this Subscription object
243 instance on this Printer object or this Job object..

244 **4.9 notify-lease-expiration-time (integer(0:MAX))**

245 This REQUIRED READ-ONLY Subscription object attribute specifies the time in the future when the
246 subscription lease will expire, i.e., the "printer-up-time" value at which the lease will expire.

247 **4.10 printer-uri (uri)**

248 This REQUIRED READ-ONLY Subscription object attribute identifies the Printer object that created this
249 Subscription object.

250 **4.11 subscriber-user-name (name(MAX))**

251 This REQUIRED READ-ONLY Subscription object attribute contains the name of the user that created the
252 Subscription object. The Printer includes the value of this attribute as the value of the SMTP "FROM" field
253 outside the <> (see RFC 822 [rfc822] section 4.4.1). For the 'mailto:' notification delivery method, the
254 client MUST supply the "requesting-user-name" operation attribute so that the Printer can populate the
255 "subscriber-user-name" Subscription attribute, in case the Printer does not have a more authenticated
256 printable name (see [ipp-ntfy]). If the client omits "requesting-user-name" attribute and the Printer doesn't
257 have a more authenticated printable name, the Printer MUST either (1) reject the operation with the 'client-
258 error-bad-request' or (2) ignore this Subscription, since the Printer will not have a User Display Name to put
259 in the "From:" field outside the <>, depending on implementation.

260 **ISSUE 05: Ok that we made "subscriber-user-name" be REQUIRED for the Printer to support and indicate**
261 **that the client MUST supply the "requester-user-name" operation attribute when the delivery method is**
262 **'mailto:', in case the Printer does not have a more authenticated printable name?**

263 **4.12 notify-printer-up-time (integer(1:MAX))**

264 This REQUIRED READ-ONLY Subscription object attribute indicates the amount of time (in seconds) that
265 the Printer implementation has been up and running. The Printer includes the value of this attribute in both
266 the Human Consumable and Machine Consumable forms.

267 **4.13 notify-persistence-granted (boolean)**

268 This REQUIRED Subscription object attribute whether or not the Per-Job or Per-Printer Subscription is
269 persistent, i.e., saved across power cycles in an implementation-define manner.

270 **5 Mail Notification Content**

271 The intent of the mail message is that the Notification Recipient is receiving a Human Consumable and/or
 272 Machine Consumable mail message from the Printer with the subject line indicating that it is a printer
 273 notification message and some implementation-defined salient information, such as the Job name and
 274 submitting user name. The body of the message duplicates this information and includes other information
 275 as REQUIRED by [ipp-ntfy].

276 Table 1 shows the SMPT fields that the IPP Printer MUST fill in from the indicated sources of the data.

277 **Table 1 - SMTP Fields to be filled in**

SMTP RFC 822 section	SMTP Field Name	Subscription object attribute source for SNMP field
4.4.1	From:	<p>"printer-name" <"subscriber-user-data"></p> <p>For example, if Bob Jones submits a print job to the Printer "George Washington" and his email address is jones@acme.com, the From: line will be displayed as:</p> <p>From: George Washington <jones@acme.com></p> <p>Mail messages appear to the Notification Recipient to come from the Printer, so that mail agents can sort and filter on the From: field.</p> <p>Note: The "printer-name" is the Mail Display name. And the "subscriber-user-data" inside <> is assumed to be an SMTP mail address so that the Notification Recipient can reply to the subscriber. For example, to say "I picked up your document, thanks."</p>
4.4.2	Sender:	<p>"subscriber-user-name" <"subscriber-user-data"></p> <p>For example, if Bob Jones submits a print job to the Printer "George Washington" and his email address is jones@acme.com, the Sender: line will be displayed as:</p> <p>Sender: Bob Jones <jones@acme.com></p> <p>Note: The "subscriber-user-name" is the Mail Display name (Bob Jones). And the "subscriber-user-data" inside <> is assumed to be an SMTP mail address so that the mail system will send failure to deliver mail messages to the mail address specified by the "subscriber-user-data", not the Printer.</p>
4.5.1	To:	The rest of the URI following the 'mailto:' scheme in the value of the "notify-recipient" attribute.

4.7.1	Subject:	Implementation-dependent, but SHOULD start with "Printer message: " (localized) followed by the job or printer event name, job name, etc. The beginning of the Subject line is a standardized prefix, so that mail agents can filter from any Printer.
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278 The Printer **MUST** repeat any of this information in these fields in the body of the message, plus additional
279 information **REQUIRED** by the Notification Specification [ipp-ntfy].

280 **5.1 Human Consumable Form**

281 If the format specified by the "notify-format" (mimeType) is a Human Consumable form, then it
282 **MUST** be sent as a MIME according to [rfc1341] and [rfc2046] if the MIME type is anything but
283 'text/plain'. Even 'text/plain; charset=utf-8' **MUST** be represented as a MIME type in the body of the
284 message.

285 **ISSUE 06: What if "notify-format" is 'text/plain; charset=utf-8', does that have to be sent as a mail**
286 **attachment, since it isn't 'text/plain' which assumes charset=us-ascii, or can it be sent as the body of the mail**
287 **message properly identified as 'text/plain; charset=us-ascii'?**

288 **5.2 Machine Consumable Form**

289 If the format specified by the "notify-format" (mimeType) is a Machine Consumable form, then it
290 **MUST** be sent as a MIME attachment according to [rfc1341] and [rfc2046], including the 'application/ipp'.

291 **6 Printer Description attributes specific to the 'mailto:' delivery method**

292 This section defines Printer Description attributes that are **REQUIRED** when supporting the 'mailto:'
293 delivery method.

294 **6.1 "printer-smtp-mail-service-address" (1setOf text(MAX))**

295 This **REQUIRED** Printer Description attribute contains the DNS or IP address of the SMTP relaying mail
296 server (see [rfc822]) that the Printer is to use to send mail messages when supporting the 'mailto:' delivery
297 method. The System Administrator is expected to configure this attribute with one or more values.

298 **7 Conformance Requirements**

299 If the IPP Printer supports the 'mailto:' notification delivery scheme, the Printer **MUST** meet these
300 conformance requirements:

- 301 1. **MUST** meet the conformance requirements defined in [ipp-ntfy].

- 302 2. MUST support at least the 'text/plain' Notification Content format. Being able to support any other
303 MIME media types (MUST be sent as mail attachments) is OPTIONAL..
- 304 3. MUST support the Subscription attribute semantics specified in section 4 when sending Notifications.
- 305 4. MUST fill in the SMTP fields in the mail message as specified in section 5.
- 306 5. MUST support the "printer-smtp-mail-service-address" (1setOf text(MAX)) Printer Description
307 attribute defined in section 6.

308 **8 IANA Considerations**

309 Since the 'mailto:' URL scheme is already defined in a standards track document and registered with IANA,
310 this document does not require anything further of IANA.

311 **9 Internationalization Considerations**

312 This notification delivery method presents no additional internationalization considerations already covered
313 in the [ipp-ntfy] document. The IPP Printer MUST localize the Human Consumable format and the 'text'
314 attributes in the Machine Consumable form. The Notification Recipient is expected to localize the
315 attributes in the Machine Consumable that have the 'keyword' attribute syntax according to the charset and
316 natural language supplied in the Notification Content which is derived from the Subscription object as
317 supplied by the Subscriber.

318 **10 Security Considerations**

319 By far the biggest security concern is the abuse of notification: sending unwanted notifications to third
320 parties (i.e., spam). The problem is made worse by notification addresses that may be redistributed to
321 multiple parties (e.g. mailing lists). There exist scenarios where third party notification is required (see
322 Scenario #2 and #3 in [ipp-not-req]). The fully secure solution would require active agreement of all
323 recipients before sending out anything. However, requirement #9 in [ipp-req] ("There is no requirement for
324 IPP Printer receiving the print request to validate the identity of an event recipient") argues against this.
325 Certain systems may decide to disallow third party notifications (a traditional facsimile model).

326 Sometimes the Notification Recipient is not the same person as the person who created the Subscription. It
327 is possible for the Notification Recipient to find out who created the Subscription, since the subscriber
328 MUST supply the "subscriber-user-name" Subscription attribute in the Subscription Creation operation.

329 The [ipp-ntfy] document discusses general security considerations for notifications. Some delivery
330 methods, such as the 'ipp:' delivery method, avoid the spam problem because the Notification Recipient
331 pulls the Notifications when desired. The 'indp:' [indp-method] delivery method allows the Notification
332 Recipient to return a special status code reply to the IPP Printer Send-Notifications operation to cancel the
333 subscription. The 'mailto:' delivery method does not permit either of these remedies.

334 **ISSUE 07 - Is there any way that a Notification Recipient could reply to the message in such a way as to**
335 **cancel the subscription and thereby solve the spam problem?**

336 Some firewall administrators are preventing mail attachments from being accepted into their organizations
337 because of the problem of the attachments containing computer viruses. The 'mailto:' delivery method
338 allows the subscriber to suppress sending any attachments, by specifying only the 'text/plain' MIME media
339 type.

340 **411** References

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