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Internet Printing Protocol (IPP):

The 'mailto~~:~~' Notification Delivery Method

Status of this Memo

This document is an IEEE-ISTO PWG temporary document and is in full conformance with all provisions of the PWG Process (see http://www.pwg.org/chair/pwg-process-990825.pdf). PWG Proposed Standards and temporary documents are working documents of the IEEE-ISTO PWG and its working groups. The intent of this temporary document is to capture the text for the "notify-mailto-report" (boolean) for requesting Machine Consumable content in addition to Human Consumable content with mailto, in case members want to implement it.

The list of current PWG drafts can be obtained at http://www.pwg.org/pub/pwg/ipp~~This document is an Internet-Draft and is in full conformance with all provisions of Section 10 of [RFC2026]. Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.~~

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Abstract

The notification extension document [ipp-ntfy] defines operations that a client can perform in order to create *Subscription Objects* in a Printer and carry out other operations on them. The Subscription Object specifies that when one of the specified *Events* occurs, the Printer sends an asynchronous *Event Notification* to the specified *Notification Recipient* via the specified *Delivery Method* (i.e., protocol).

The notification extension document [ipp-ntfy] specifies that each Delivery Method is defined in another document. This document is one such document, and it specifies the 'mailto' delivery method.

For this Delivery Method, when an Event occurs, the Printer immediately sends an Event Notification via an email message to the Notification Recipient specified in the Subscription Object. The message body of the email consists of Human Consumable text ~~and~~that is not intended to be parsed by a machine. The message body optionally consists of Machine Consumable content as well.

The Notification Recipient receives the Event Notification in the same way as it receives any other email message.

The ~~full~~basic set of IPP documents includes:

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

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

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

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

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

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

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

The "Event Notification Specification" document describes an extension to the IPP/1.0, IPP/1.1, and future versions. This extension allows a client to subscribe to printing related Events. The Subscription Object specifies that when one of the specified *Event* occurs, the Printer sends an asynchronous *Event Notification* to the specified *Notification Recipient* via the specified *Delivery Method* (i.e., protocol). A client associates Subscription Objects with a particular Job by performing the Create-Job-Subscriptions operation or by submitting a Job with subscription information. A client associates Subscription Objects with the Printer by performing a

Create-Printer-Subscriptions operation. Four other operations are defined for Subscription Objects: Get-Subscriptions-Attributes, Get-Subscriptions, Renew-Subscription, and Cancel-Subscription.

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1 Introduction

The notification extension document [ipp-ntfy] defines operations that a client can perform in order to create *Subscription Objects* in a Printer and carry out other operations on them. A Subscription Object represents a Subscription abstraction. The Subscription Object specifies that when one of the specified *Events* occurs, the Printer sends an asynchronous *Event Notification* to the specified *Notification Recipient* via the specified *Delivery Method* (i.e., protocol).

The notification extension document [ipp-ntfy] specifies that each Delivery Method is defined in another document. This document is one such document, and it specifies the 'mailto' delivery method.

For this Delivery Method, when an Event occurs, the Printer immediately sends an Event Notification via an email message to the Notification Recipient specified in the Subscription Object. The message body of the email consists of Human Consumable text ~~and~~that is not intended to be parsed by a machine. The message body may also contain Machine Consumable content. The 'mailto' Delivery Method is a 'push' Delivery Method as defined in [ipp-ntfy].

The Notification Recipient receives the Event Notification in the same way as it receives any other email message.

2 Terminology

This section defines the following terms that are used throughout this document:

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

For capitalized terms that appear in this document, see [ipp-ntfy].

3 Model and Operation

In a Subscription Creation Operation, when the value of the "notify-recipient-uri" attribute contains the scheme "mailto", the client is requesting that the Printer use the 'mailto' Delivery Method for Event Notifications generated from the new Subscription Object.

For this Delivery Method, the "notify-recipient-uri" attribute value MUST consist of a "mailto" scheme followed by a colon, and then followed by an address part (e.g. 'mailto:smith@abc.com'). See section 5.2.1 for the syntax of the "notify-recipient-uri" attribute value for this Delivery Method.

A Printer MUST support SMTP [RFC821], and it MAY support other email protocols. A Printer MAY use additional services, such as SMTP delivery status notification [RFC1891] or S/MIME encryption [RFC2633].

If the client wants the Printer to send Event Notifications via the 'mailto' Delivery Method, the client MUST choose a value for "notify-recipient-uri" attribute which conforms to the rules of section 5.2.1. To avoid denial-of-service attacks, a client SHOULD NOT use distribution lists as the Notification Recipient.

When an Event occurs, the Printer MUST immediately:

1. Find all pertinent Subscription Objects P according to the rules of section 9 of [ipp-ntfy], AND
2. Find the subset M of these Subscription Objects P whose "notify-recipient-uri" attribute has a scheme value of 'mailto', AND
3. For each Subscription Object in M, the Printer MUST
   a) generate an email message as specified in section 5.2.2 AND
   b) send the email message to the Notification Recipient specified by the address part of the "notify-recipient-uri" attribute value (see section 5.2.1).

If the Printer supports only SMTP, it MUST send the email message via SMTP. If the Printer supports additional email protocols, it MUST determine the protocol from the address part of the "notify-recipient-uri" attribute value and then send the email message via the appropriate email protocol.

When a Subscribing Client is subscribing to the 'job-progress' event (which is a frequently occurring event), it SHOULD supply the "notify-time-interval" attribute (see [ipp-ntfy]) in the Subscription Creation request with a suitable value to limit the time between 'job-progress' Event Notifications sent by the Printer.

4 General Information

If a Printer supports this Delivery Method, the following are its characteristics.

Table 1 – Information about the Delivery Method

Document Method Conformance Requirement	Delivery Method Realization
1. What is the URL scheme name for the Delivery Method?	mailto
2. Is the Delivery Method REQUIRED, RECOMMEND, or OPTIONAL for an IPP Printer to support?	RECOMMENDED
3. What transport and delivery protocols does the Printer use to deliver the Event Notification Content, i.e., what is the entire network stack?	A Printer MUST support SMTP. It MAY support other email protocols.
4. Can several Event Notifications be combined into a Compound Event Notification?	A Printer implementation MAY combine several Event Notifications into a single email message.
5. Is the Delivery Method initiated by the Notification Recipient (pull), or by the Printer (push)?	This Delivery Method is a push.

6. Is the Event Notification content Machine Consumable or Human Consumable?	Human Consumable and Machine Consumable
7. What section in this document answers the following question? For a Machine Consumable Event Notification, what is the representation and encoding of values defined in section 9.1 of [ipp-ntfy] and the conformance requirements thereof? For a Human Consumable Event Notification, what is the representation and encoding of pieces of information defined in section 9.2 of [ipp-ntfy] and the conformance requirements thereof?	Section 6
8. What are the latency and reliability of the transport and delivery protocol?	Same as the underlying SMTP (or other optional) email transport
9. What are the security aspects of the transport and delivery protocol, e.g., how it is handled in firewalls?	Same as the underlying SMTP (or other optional) email transport
10. What are the content length restrictions?	None
11. What are the additional values or pieces of information that a Printer sends in an Event Notification content and the conformance requirements thereof?	None
12. What are the additional Subscription Template and/or Subscription Description attributes and the conformance requirements thereof?	See section 5.1.1 on "notify-mailto-text-only" and see section 5.1.2 on "notify-mailto-report"
13. What are the additional Printer Description attributes and the conformance requirements thereof?	None

5 Subscription Template Attributes

5.1 Additional Subscription Template Attributes

This Delivery Method introduces ~~one~~two additional Subscription Template ~~Attribute.~~Attribute (See Table 2.)

Table 2 – Additional Subscription Template Attributes

Attribute in Subscription Object	Default and Supported Printer Attributes
notify-mailto-text-only (boolean)	N/A
notify-mailto-report (boolean)	notify-mailto-report-supported (boolean)

5.1.1 notify-mailto-text-only (boolean)

When the Printer generates an Event Notification from a Subscription Object, this attribute specifies whether the Printer generates the Event Notification with only plain text (i.e. 'text/plain') or with Content-Types that the Printer chooses. This attribute controls the representation of the Human Consumable content.

The Printer MUST support this attribute if it supports the 'mailto' Delivery Method.

A client MAY supply this attribute. If a client does not supply this attribute, the Printer MUST populate this attribute with the value of 'false' on the Subscription Object. There is no "notify-mailto-text-only-default" attribute.

If the value of this attribute is 'true' in a Subscription Object, the message body of each Event Notification that the Printer generates from the Subscription Object MUST contain plain text only (i.e. 'text/plain' with the charset specified by the "notify-charset' Subscription Object attribute).

If the value of this attribute is 'false' in a Subscription Object, the Content-Type of the message body of each Event Notification that the Printer generates from the Subscription Object MUST ~~contain a 'multipart/alternative'. One~~be either 'text/plain' or 'multipart', depending on implementation. If the Content-Type is 'multipart', one message body of the 'multipart~~/alternative~~' MUST be the same as the 'text/plain' message body when this attribute has the value of 'true'. Each of the other message bodies of the 'multipart~~/alternative~~' MAY be any Content-Type (e.g. 'text/html', 'image/gif', 'audio/basic', etc.).

A Printer MUST support both values ('true' and 'false') of this attribute. There is no "notify-mailto-text-only-supported" attribute.

5.1.2 notify-mailto-report (boolean)

When the Printer generates an Event Notification from a Subscription Object, this attribute specifies whether the Printer generates the Event Notification as a report. When the Event Notification is a report, it contains both Human Consumable and Machine Consumable content. The Content-Type of the Machine Consumable content is 'application/ipp'. When the Event Notification is not a report, it contains only Human Consumable content. The format of the Human Consumable content for both values of this attribute is controlled by the "notify-mailto-text-only" attribute (see section 5.1.1).

The Printer MAY support this attribute if it supports the 'mailto' Delivery Method. If a Printer does not support this attribute, it behaves as if the value of this attribute were 'false'.

A client MAY supply this attribute. If a client does not supply this attribute and the Printer supports this attribute, the Printer MUST populate this attribute with the value of 'false' on the Subscription Object. There is no "notify-mailto-report-default" attribute.

If the value of this attribute is 'true' in a Subscription Object, the Content-Type of the message body of each Event Notification that the Printer generates from the Subscription Object MUST be 'multipart/report' and the 'report-type' parameter MUST be 'application/ipp'. There MUST be an additional IPP specific parameter 'report-content' whose value is 'ipp-notify'. The 'report-content' parameter allows an email client to separate Event

Notifications from other email. The first body part of the report MUST contain the Human Consumable content described in this document and controlled by the "notify-mailto-text-only" attribute. The second body part of the report MUST contain the Machine Consumable content and its Content-Type MUST be 'application/ipp'.

If the value of this attribute is 'false' in a Subscription Object, the message body of each Event Notification that the Printer generates from the Subscription Object MUST contain only the Human Consumable content described in this document.

If Printer supports this attribute, it MUST also support the "notify-mailto-report-supported" attribute and it MUST have a value of 'true'. If Printer does not support this attribute, the "notify-mailto-report-supported" attribute MUST either have a value of 'false' or not be present on the Printer.

If a client supplies this attribute and the Printer doesn't support it, the Printer MUST behave as if the value were 'false' and MUST return the attribute as an unsupported attribute.

5.2 Additional Information about Subscription Template Attributes

This section describes additional values for attributes defined in [ipp-ntfy].

5.2.1 notify-recipient-uri (uri)

This section describes the syntax of the value of this attribute for the 'mailto' Delivery Method. The syntax for values of this attribute for other Delivery Method is defined in other Delivery Method Documents.

In order to support the 'mailto' Delivery Method, the Printer MUST support the following syntax for the 'mailto' Delivery Method when the Printer uses SMTP. The line below use RFC 822 syntax rules and terms.

"mailto:" mailbox

Note: the above syntax allows 1 occurrence of 'mailbox'. The occurrence of 'mailbox' represents an email address of a Notification Recipient.

For SMTP, the phrase 'address part' of the "notify-recipient-uri" attribute value refers to the 'mailbox' part of the value.

The Printer MAY support other syntax for the 'address part' if it supports email protocols in addition to SMTP.

5.2.2 notify-user-data (octetString(63))

This attributes has a special use for the 'mailto' Delivery Method. It specifies the email address of the Subscribing Client. It is primarily useful when the Notification Recipient is some person other than the Subscribing Client. Then the Notification Recipient has a way to reply to the Subscribing Client.

If a client specifies this Delivery Method in a Subscription Creation Operation, and the specified Notification Recipient is not associated with the same person as the client, the client SHOULD supply its email address as the

value of the "notify-user-data" attribute. If the client does not supply this attribute, the Printer MUST NOT populate the Subscription Object with this attribute.

6 Event Notification Content

This section describes the content of an Event Notification sent via the 'mailto' Delivery Method using the SMTP protocol. This document does not describe the content for other email protocols, but an implementation should use this section as a model.

When a Printer sends an email message via SMTP, the content MUST conform to RFC 822. The following sections define the content that a Printer MUST send. A Printer MAY send additional content as long as the resulting content conforms to RFC 822.

Each subsection below specifies the syntax that pertains to the subsection. The syntax rules and syntactic terms (e.g. 'date-time') in each subsection come from RFC 822, except for the section on "Content-Type" which comes from RFC 1521.

The Event Notification content has two parts, the headers and the message body. The headers precede the message body and are separated by a blank line (see [RFC 822]).

6.1 Headers

When a Printer sends an Event Notification via SMTP, it MUST include the following headers. RFC 822 RECOMMENDS that the headers be in the order that they appear below.

6.1.1 'Date' header

Syntax: "Date" ":" date-time

This header contains the date and time that the Event occurred.

The Printer MUST include a "Date" header if and only if it supports the "printer-current-time" Printer attribute.

6.1.2 'From' header

Syntax: "From" ":" mailbox

where

mailbox = addr-spec / phrase route-addr

This header causes a typical email reader to show the email as coming from the Printer that is sending the Event Notification.

The Printer MUST include a "From" header whose syntax is specified above.

The Printer MUST use the second alternative of the syntax for 'mailbox' defined above (i.e. 'phrase route-addr'). The 'phrase' is the Printer's display name and it MUST be the value of the "printer-name" Printer attribute. The 'route-addr' MUST contain an email address (inside angle brackets) belonging to either an administrator or the output-device. This email address NEED NOT be capable of receiving mail. There is no Printer attribute to hold this email address, so that it cannot be configured using the IPP protocol without an implementation-defined attribute extension.

6.1.3 'Subject' header

Syntax: "Subject" ":" *text

This header specifies the subject of the message and contains a short summary of the Event Notification.

The Printer MUST include a "Subject" header whose syntax is specified above.

The Printer MUST localize the '*text' using the values of the "notify-charset" and "notify-natural-language" Subscription Object attributes.

For Printer Events, the '*text' SHOULD start with the localized word "printer:", followed by the Printer name, and then followed by the localized Event name, e.g., in English: "printer: 'tiger' stopped" or in ~~French: 'imprimeur: 'tigre' arrêté'.~~Danish: 'Printeren 'tiger' er standset'.

For Job Events, the '*text' SHOULD start with the localized phrase "print job:", followed by the Job name, and then followed by the localized Event name, e.g., in English: "print job: 'financials' completed".

The wording is implementation dependent. A Notification Recipient MUST NOT expect to be able to parse this text. But an email filter might look for "printer" or "print job".

6.1.4 'Sender' header

Syntax: "Sender" ":" mailbox

This header causes a typical email reader to show the email as coming on behalf of the person associated with the Subscribing Client.

If the Subscription Object contains the "notify-user-data" attribute, and if its value satisfies the RFC 822 syntax rules for 'mailbox', the Printer MUST include a "Sender" header whose syntax is specified above. Otherwise, the Printer MUST NOT include a "Sender" header.

For the "Sender" header, the 'mailbox' MUST be the value of the "notify-user-data" Subscription Object attribute. See section 5.2.2 for details about the "notify-user-data" attribute.

6.1.5 'Reply-to' header

Syntax: "Reply-to" ":" mailbox

If the Notification Recipient replies to Event Notification email, this header causes a typical email reader to send email to the person acting as the Subscribing Client. The rules are identical to the "Sender" header.

If the Subscription Object contains the "notify-user-data" attribute, and if its value satisfies the RFC 822 syntax rules for "mailbox", the Printer MUST include a "Reply-to" header whose syntax is specified above. Otherwise, the Printer MUST NOT include a "Reply-to" header.

For the "Reply-to" header, the "mailbox" MUST be the value of the "notify-user-data" Subscription Object attribute. See section 5.2.2 for details about the "notify-user-data" attribute.

6.1.6 'To' header

Syntax: "To" ":" 1#mailbox

See [RFC 1521] for the syntax.

This header specifies the Notification Recipient(s).

The Printer MUST include a "To" header whose syntax is specified above.

The '1#mailbox' MUST be the '1#mailbox' part of the value of the "notify-recipient-uri" Subscription attribute, i.e. the part after the "mailto:".

6.1.7 'Content-type' header

Syntax: "Content-Type" ":" type "/" subtype *(";"parameter)

See [RFC 1521] for the syntactic terms (e.g. 'type').

This header specifies the format of the message body.

The Printer MUST include the "Content-Type" header.

~~If the value of the "notify-mailto-text-only" Subscription Object attribute is 'true', the 'type' MUST be "plain", the 'subtype' MUST be "text" and the 'parameter' MUST be ' "charset=" XXX' where XXX is the value of the "notify-charset" Subscription Object attribute, e.g. 'text/plain;charset=UTF-8'.~~

~~If the value of the "notify-mailto-text-only" Subscription Object attribute is 'false', the 'type' MUST be "multipart", the 'subtype' MUST be "alternative" and the 'parameter' MUST include the boundary string. Each header of a body part of a multipart entity also has a Content-Type and its value of 'type', 'subtype' and 'parameter' MUST be values allowed by RFC 1521 or some registered MIME type. That is, a Printer MAY send any format it wishes in each body part of a multipart entity, e.g. 'text/html', 'image/gif', or 'audio/basic'.~~The "notify-mailto-text-only" and "notify-mailto-report" attributes determine the 'type' and 'subtype' values. The possible values are "text/plain", "multipart/report" and other "multipart" values.

6.2 Message Body

The message body MUST contain either Human Consumable content only or both Human Consumable and Machine Consumable content. The Human Consumable content MUST contain plain text. It MAY also contain other types of implementation dependent content.

~~This document describes a message body that is plain text. The content of all other Content-Types is~~For plain text, the Content-Type of Human Consumable content MUST be 'text/plain'. For implementation dependent content, the Content-Type of Human Consumable content MUST be 'multipart'. The Content-Type of one body part MUST be 'text/plain' and the Content-Types of the other body parts are implementation dependent. ~~A Printer MUST include a plain text message even when it sends other Content-Types in a 'multipart/alternative'.~~ See section 6.3 for a description of plain text content.

The Content-Type of Machine Consumable content MUST be 'application/ipp'. See section 6.4 for a description of Machine Consumable content

The following table shows the Content-Type of the message body for each combination of the "notify-mailto-text-only" and "notify-mailto-report" attributes:

"notify-mailto-report" attribute	**"notify-mailto-text-only" attribute**	**Content-Type of Message Body**	**Message Body**
false	false	'text/plain'	Human Consumable
false	true	'text/plain' or*	Human Consumable plain text
		'multipart'	Human Consumable where one body part is plain text
true	false	'multipart/report'	First body part: Human Consumable plain text Second body part: Machine Consumable. The Content-Type is 'application/ipp'
true	true	'multipart/report'	First body part: Human Consumable. The Content-Type is 'multipart' where one body part is plain text Second body part: Machine Consumable. The Content-Type is 'application/ipp'

* The Content-Type depends on the implementation. A Printer MAY send 'text/plain' only or it MAY send several body parts of various Content-Types within a message body whose Content-Type is 'multipart'.

6.3 Plain Text Content

When a Printer sends a plain text message, it MUST localize the text using the values of the "notify-charset" and "notify-natural-language" Subscription Object attributes.

Section 9.2 in [ipp-ntfy] specifies the information that a Delivery Method MUST specify and a Printer SHOULD send.

~~This section contains the information from section 9.2 in [ipp-ntfy] and changes "Printer~~A Printer SHOULD~~send" to "Printer MUST send".~~

~~A Printer MUST~~ send the following localized information in the message body. The specific wording of this information and its layout are implementation dependent.

a) the Printer name (see Table 3~~Table 2~~)
b) omitted (see below).
c) for Printer Events only:
   i) the Event (see Table 4~~Table 3~~) and/or Printer state information (see Table 7~~Table 6~~)
d) for Job Events only:
   i) the job identity (see Table 5~~Table 4~~)
   ii) the Event (see Table 4~~Table 3~~) and/or Job state information (see Table 6~~Table 5~~)

Item b) in the above list is omitted because the Printer sends the time of the Event as an email header (see section 6.1.1 on the 'Date' header).

The subsections of this section specify the attributes that a Printer MUST use to obtain this information.

The Printer MAY send additional information, depending on implementation.

Notification Recipients MUST NOT expect to be able to parse the message.

The next three sections define the attributes in Event Notification Contents that are:

a) for all Events

b) for Job Events only

c) for Printer Events only

6.3.1 Event Notification Content Common to All Events

The Printer MUST send the following information.

There is a separate table for each piece of information. Each row in the table represents a source value for the information and the values are listed in order of preference, with the first one being the preferred one. An implementation SHOULD use the source value from the earliest row in each table. It MAY use the source value

from another row instead, or it MAY combine the source values from several rows. An implementation is free to determine the best way to present this information.

The tables in this section and following sections contain the following columns for each piece of information:

a) **Source of Value:** the name of the attribute that supplies the value for the Event Notification

~~b)~~**Sends:** ~~if the Printer supports the value (column 1) on the Source Object (column 3) the Delivery Method MUST specify~~

~~**MUST:** that the Printer MUST send the value.~~

~~**SHOULD:** either that the Printer MUST send the value or that the value is incompatible with the Delivery Method.~~

b) ~~**MAY:** that the Printer MUST, SHOULD, MAY, MUST NOT, SHOULD NOT, or NEED NOT send the value. The Delivery Method specifies the level of conformance for the Printer.~~

MAY: this is the only value used in the tables. It means that the Printer OPTIONALLY sends this value. However, , the Printer SHOULD use at least one value from each table

c) **Source Object:** the object from which the source value comes.

~~In all tables of this section, all rows contain a "MAY" in order to state that the Delivery Method specifies the conformance.~~

Table 3~~Table 2~~ lists the source of the information for the Printer Name. The "printer-name" is more user-friendly unless the Notification Recipient is in a place where the Printer name is not meaningful. For example, an implementation could have the intelligence to send the value of the "printer-name" attribute to a Notification Recipient that can access the Printer via value of the "printer-name" attribute and otherwise send the value of the "notify-printer-uri" attribute.

Table 3 – Printer Name in Event Notification Content

Source Value	Sends	Source Object
printer-name (name(127))	MAY	Printer
notify-printer-uri (uri)	MAY	Subscription

Table 4~~Table 3~~ lists the source of the information for the Event name. A Printer MAY combine this information with state information described for Jobs in Table 6~~Table 5~~ or for Printers in Table 7~~Table 6~~.

Table 4 – Event Name in Event Notification Content

Source Value	Sends	Source Object
notify-subscribed-event (type2 keyword)	MAY	Subscription

6.3.2 Additional Event Notification Content for Job Events

This section lists the source of the additional information that a Printer MUST send for Job Events.

Table 5~~Table 4~~ lists the source of the information for the job name. The "job-name" is likely more meaningful to a user than "job-id".

Table 5 – Job Name in Event Notification Content

Source Value	Sends	Source Object
job-name (name(MAX))	MAY	Job
job-id (integer(1:MAX))	MAY	Job

Table 6~~Table 5~~ lists the source of the information for the job-state. If a Printer supports the "job-state-message" and "job-detailed-state-message" attributes, it SHOULD use those attributes for the job state information, otherwise, it should fabricate such information from the "job-state" and "job-state-reasons". For some Events, a Printer MAY combine this information with Event information.

Table 6 – Job State in Event Notification Content

Source Value	Sends	Source Object
job-state-message (text(MAX))	MAY	Job
job-detailed-status-messages (1setOf text(MAX))	MAY	Job
job-state (type1 enum)	MAY	Job
job-state-reasons (1setOf type2 keyword)	MAY	Job

6.3.3 Additional Event Notification Content for Printer Events

This section lists the source of the additional information that a Printer MUST send for Printer Events.

Table 7~~Table 6~~ lists the source of the information for the printer-state. If a Printer supports the "printer-state-message", it SHOULD use that attribute for the job state information, otherwise it SHOULD fabricate such information from the "printer-state" and "printer-state-reasons". For some Events, a Printer MAY combine this information with Event information.

Table 7 – Printer State in Event Notification Content

Source Value	Sends	Source Object
printer-state-message (text(MAX))	MAY	Printer
printer-state (type1 enum)	MAY	Printer
printer-state-reasons (1setOf type2 keyword)	MAY	Printer
printer-is-accepting-jobs (boolean)	MAY	Printer

6.4 Machine Consumable Content

The body part of a Machine Consumable content is the same as the message body of a Send-Notifications request for the indp Delivery Method, except that the value of the "request-id" attribute doesn't matter because the Notification Recipient doesn't send a response. See section 9.1.1 of [ipp-indp].

6.5 Examples

This section contains three examples. One is a Job Event and the other two are Printer Events, the latter in Danish.

A Printer implementation NEED NOT generate Event Notification content that is identical or even similar to these examples. In fact it would be unfortunate if every implementation copied these example as is. These examples merely show some possibilities and are not necessarily the best way to convey information about an Event.

6.5.1 Job Event Example

This section contains an example of an Event Notification of a Job Event.

A Subscribing Client Mike Jones (who works for xyz Corp.) performs a Subscription Creation Operation as part of the Print-Job operation on Printer "ipp://tiger@abc.com". Mike Jones specifies that the "job-name" is "financials". Mike is printing the Job for Bill Smith at abc Corp. The Subscription Object then has the following attributes:

Attribute Name	Attribute Value
notify-recipient-uri	mailto:bsmith@abc.com
notify-events	job-completed
notify-user-data	mjones@xyz.com
notify-mailto-text-only	true
notify-mailto-report	false
notify-charset	us-ascii
notify-natural-language	en-us
notify-subscription-id	35692

Attribute Name	Attribute Value
notify-sequence-number	0
notify-printer-up-time	34593
notify-printer-uri	ipp://tiger@abc.com
notify-job-id	345
notify-subscriber-user-name	mjones

When the Job completes, the Printer generates and sends the following email message:

```
Date: 17 Jul 00 1632 PDT
From: tiger <printAdmin@abc.com>
Subject: print job: 'financials' completed
Sender: mjones@xyz.com
Reply-to: mjones@xyz.com
To: bsmith@abc.com
Content-type: text/plain

printer: tiger
job: financials
job-state: completed
```

The reader should note that the phrases are not identical to IPP keywords. They have been localized to English.

6.5.2 Printer Event Example

This section contains an example of an Event Notification of a Printer Event.

A Subscribing Client Peter Williams, a Printer admin, performs a Create-Printer-Subscriptions operation on Printer "ipp://tiger@abc.com". The Subscription Object then has the following attributes:

Attribute Name	Attribute Value
notify-recipient-uri	mailto:pwilliams@abc.com
notify-events	printer-state-changed
notify-mailto-text-only	true
notify-mailto-report	false
notify-charset	us-ascii
notify-natural-language	en-us
notify-subscription-id	4623
notify-sequence-number	0
notify-printer-uptime	23002
notify-printer-uri	ipp://tiger@abc.com
notify-lease-expiration-time	0

Attribute Name	Attribute Value
notify-subscriber-user-name	pwilliams

When the Printer jams, the Printer generates and sends the following email message:

```
Date: 29 Aug 00 0832 PDT
From: tiger <printAdmin@abc.com>
Subject: printer: 'tiger' has stopped
To: pwilliams@abc.com
Content-type: text/plain

Printer tiger has stopped with a paper jam.
```

The reader should note that the phrases are not identical to IPP keywords. They have been localized to English.

6.5.3 Printer Event Example with a Report

This section is identical to the preceding example except that the "notify-mailto-report" attribute is 'true'.

When the Printer jams, the Printer generates and sends the following email message.

The Machine Consumable body part below is represented in a symbolic manner with the following characteristics:

a) Fields that specify length of the following attribute name or value are not shown
b) Other binary data is enclosed in angle brackets with the symbolic name or 2 hex-digits per octet.
c) Commas separate fields when an angle bracket is not present to delimit fields.
d) The '<>' mean empty octet-string
e) Comments occur between the ';' and the end of the line.

```
Date: 29 Aug 00 0832 PDT
From: tiger <printAdmin@abc.com>
Subject: printer: 'tiger' has stopped
To: pwilliams@abc.com
Content-type: multipart/report;
    boundary="simpleBoundary",
    report-type=application/ipp,
    report-content=ipp-notify

--simpleBoundary
Content-Type: text/plain

Printer tiger has stopped with a paper jam.
--simpleBoundary
Content-Type: application/ipp

<0101>                  ; Version 1.1
```

```
<001D>                  ; operation Send-Notifications
<00000000>              ; request-id
<operation-attributes>   ; tag for operations attributes
                        ; the 2 lines below contain a syntax type,
                        ; an attribute name and an attribute value
<charset>attributes-charset,us-ascii
<natural-language>attributes-natural-language,en-us
<event-notification>  ; tag for Event-Notification Attributes Group
                        ; each line below contains a syntax type,
                        ; an attribute name and an attribute value
<integer>notify-subscription-id<123>
<uri>notify-printer-uri,tiger
<keyword>notify-subscribed-event,printer-stopped
<integer>printer-uptime<12345>
<integer>notify-sequence-number<48>
<charset>notify-charset,us-ascii
<natural-language>notify-subscribed-event,en-us
<octet-string>notify-subscribed-event<>
<text>notify-text,Printer tiger has stopped with a paper jam.
<enum>printer-state<stopped>
<keyword,printer-state-reasons,media-jam
<boolean>printer-is-accepting-jobs<true>
<end-of-attributes>    ; end of attribute tag

--simpleBoundary
```

6.5.4 Printer Event Example (localized to Danish)

This section contains an example of an Event Notification of a Printer Event localized to Danish.

A Subscribing Client Per Jensen, a Printer admin, performs a a Create-Printer-Subscriptions operation on Printer "ipp://tiger@def.dk". The Subscription Object then has the following attributes:

Attribute Name	**Attribute Value**
notify-recipient-uri	mailto:pjensen@def.dk
notify-events	printer-state-changed
notify-mailto-text-only	true
notify-mailto-report	false
notify-charset	utf-8
notify-natural-language	da
notify-subscription-id	50225
notify-sequence-number	0
notify-printer-uptime	53217

Attribute Name	Attribute Value
notify-printer-uri	ipp://tiger@def.dk
notify-lease-expiration-time	0
notify-subscriber-user-name	pjensen

When the Printer jams, the Printer generates and sends the following email message:

```
Date: 29 Jan 00 0832 CET
From: tiger <admin@def.dk>
Subject: Printeren 'tiger' er standset
To: pjensen@def.dk
Content-type: text/plain;charset=utf-8

Printerens navn er 'tiger'.
Printeren er standset.
Aarsagen er papir stop.
```

7 Conformance Requirements

If the Printer supports the 'mailto' Delivery Method, the Printer MUST:

1. meet the conformance requirements defined in [ipp-ntfy].
2. support the "notify-mailto-text-only " Subscription Object attribute defined in section 5.1.1.
3. support the syntax for the "notify-recipient-uri" Subscription Object attribute defined in section 5.2.1
4. support the use for the "notify-user-data" Subscription Object attribute defined in section 5.2.2
5. support SMTP for sending Event Notifications.
6. support the 'text/plain' Content-Type for the message body.
7. support sending Event Notification via email with the content specified in section 5.1.2~~5.2~~.

8 IANA Considerations

Because the 'mailto' URL scheme is already defined in a standards track document [RFC 2368] and registered with IANA, this document does not require anything further of IANA.

9 Internationalization Considerations

This Delivery Method presents no internationalization considerations beyond those covered in the [ipp-ntfy] document, and sections 6.1.3 and 6.2 of this document.

The Notification Recipient is expected to present the email as received because the Printer does all necessary localization to the Event Notification contents.

10 Security Considerations

The biggest security concern is that a Subscribing Client will cause unsolicited Event Notifications to be sent to third parties, potentially creating denial-of-service problems (i.e., spam). The problem is even worse if the third parties are distribution lists.

There exist scenarios where third party notification is required (see Scenario #2 and #3 in [ipp-not-req]). The fully secure solution would require active agreement of all persons before they can become Notification Recipients. However, requirement #9 in [ipp-req] ("There is no requirement for IPP Printer receiving the print request to validate the identity of an event recipient") argues against this. To minimize the risk, a Printer could disallow third party Notification Recipients (a traditional facsimile model).

The Delivery Method recommends that the Subscribing Client supply his or her email address as the value of the "notify-user-data" attribute in the Subscription Creation Operation when the Notification Recipient is a third party. To reduce the chance of spamming or identify the spammer, a Printer could disallow third party Notification Recipients if the Subscribing Client doesn't supply the "notify-user-data" attribute with a valid email address.

Some firewall administrators prevent mail attachments from being accepted into their organizations because of the problem of the attachments containing computer viruses. The 'mailto' Delivery Method allows the Subscribing Client to request that the Content-Type of a message body be 'text/plain'.

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