Internet Printing Protocol (IPP)

Delivery Methods for
IPP Event Notifications

Quick Summary of Notification Subscriptions

- A Subscribing Client requests a Printer to create a Subscription Object with attributes:
  - "notify-events": one or more Subscribed Events
    - Printer sends an Event Notification when a matching Event occurs
  - "notify-recipient-uri": a URL
    - scheme specifies Event Notification Delivery Method
    - address specifies the Notification Recipient
  - other attributes

Quick Summary of Notification
Event Notifications

- A Subscription Object specifies that
  - The Printer send an Event Notification
    - to a specified Notification Recipient
    - using a specified Delivery Method
    - whenever an Event occurs that matches a Subscribed Event

Quick Summary of Notification Delivery Methods

- Four Delivery Methods (to specified URL)
  - mailto:
    - email an event notification
  - indp:
    - use INDP over http to send event notifications
  - ippget:
    - use IPP to get (poll) accumulated event notifications
  - snmpnotify:
    - target of URL is an SNMP notification receiver

Quick Summary of Notification
Event Notification Content

- An Event Notification is either
  - Human Consumable or
    - mailto
  - Machine Consumable
    - indp
    - ippget
    - snmpnotify

Quick Summary of Notification
Human Consumable Event Notification

- An Event Notification contains information such as:
  - Printer name (e.g. 'tiger')
  - Subscribed Event that matched the Event (e.g. 'job-completed')
  - Date and time (e.g. August 1, 2000 10:00 am)
  - Job name (for Job Events such as 'job-completed')
  - Job state (for Job Events such as 'job-completed')
  - Printer state (for Printer Events such as 'printer-stopped')
- An implementation can present this information in any way it chooses.

Quick Summary of Notification
Machine Consumable Event Notification

- An Event Notification contains values from attributes such as:
  - "notify-subscription-id" from Subscription Object
  - "notify-printer-uri" from Subscription Object
  - "notify-subscribed-event" (that matched Event)
  - "printer-up-time" from Printer Object
  - "notify-sequence-number" from Subscription Object
  - "notify-text" (like 'text/plain' message body in mailto)
  - "job-id" from Job object (for Job Events)
  - "job-state" from Job object (for Job Events)
  - "printer-state" from Printer Object (for Printer Events)

mailto: Delivery Method

- ## The Printer
  - – sends email to URL "notify-recipient-uri"
    - implementations must support SMTP
    - interfaces to existing gateways for paging, voicemail and instant messaging.
- ## An SMTP email transmission includes
  - – several headers
  - – a message body

mailto: Delivery Method
Headers

- the Headers are:
  - Date: value of "printer-current-time" (if supported)
  - From: value of "notify-printer-uri" and admin email address between angle brackets.
  - Subject: summary of event (implementation dependent)
  - Sender: value of "notify-user-data" if present
  - Reply-To: value of "notify-user-data" if present
  - To: value of address of "notify-recipient-uri"
  - Content-Type: 'text/plain' or 'multipart/alternative'

mailto: Delivery Method
Message Body

- The Message Body is either
  - 'text/plain' or
    - see the Human Consumable slide for the contents.
  - 'multipart/alternative'
    - where one message body is 'text/plain'
    - other message bodies are implementation dependent
- Subscribing Client specifies whether the Printer must send 'text/plain' only.

mailto: Delivery Method Example

```
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
```

indp: Delivery Method concept

- A new protocol for a notification service
  - Leverages encoding and semantics from IPP
  - Notification Recipient behaves like an HTTP server
  - A Printer behaves like an HTTP client
    - it performs the Send-Notifications operation to send Event Notifications to the Notification Recipient

indp: Delivery Method
Send-Notifications operation

- The Printer performs the Send-Notifications operation after one or more Events occur
  - An Event Notification contains IPP attributes as described in the Machine Consumable slide
  - the operation and attributes are encoded as in IPP.
    - The request encodes attributes in a way that is similar to a Get-Jobs response except that the attributes are in a Event Notifications Attribute group instead of a Job Attributes group.

ippget: Delivery Method concept

- The IPP Printer
  - saves each event for a fixed amount of time
  - supports the new IPP Get-Notifications operation
    - a client polls for Event Notifications with a request
    - a Printer responds with:
      - zero or more Event Notifications
      - the recommended time to poll again
      - the time when future Event Notifications begin to expire

ippget: Delivery Method Get-Notifications Response

- The Get-Notifications response is like the Get-Jobs response except:
  - Each group is a Notification attribute group instead of a Job attribute group
  - Each attribute is belongs to an Event Notification instead of a Job.

Delivery Methods forIPP Event Notifications

snmpnotify: Delivery Method

- The Printer sends
  - SNMP trap or inform requests
  - to the specified notification recipient URL
- Specified as an extension to the Job Monitoring MIB RFC 2707

Question

- Should any of the Delivery Methods be required?
- If so, which ones?

Delivery Methods forIPP Event Notifications

Internet Printing Protocol (IPP)

HTTP Chunking

HTTP:
Proxy Support of Chunking

- Do HTTP proxies support chunking
  - for POST in requests?
  - for POST in responses?