

**Internet Printing Project Meeting Minutes**  
**March 4/5, 1998**  
**Austin, Texas**

The meeting started on March 4, 1998 at 1:00 PM led by Carl-Uno Manros. These minutes were recorded by Don Wright. The attendees were:

- Randy Turner - Sharp
- Ron Bergman - DataProducts
- Peter Zehler - Xerox
- Lee Farrell - Canon
- Bob Pentecost - HP
- Kris Schoff - HP
- Don Wright - Lexmark
- Tom Hastings - Xerox
- Carl-Uno Manros - Xerox
- Bob Herriot - Sun
- Henrik Holst - I-Data
- Harry Lewis - IBM
- Paul Moore - Microsoft
- Jim Walker - Dazel
- Scott Isaacson - Novell
- Shivaun Albright - HP
- Mabry Dozier - QMS
- Yuji Sasaki - JCI
- Marvin Heffler - IBM
- Roger deBry- IBM
- Lloyd Young - Lexmark
- Bill Wagner - Osicom/DPI
- Brian Batchelder - HP
- Chuck Adams - Tektronix
- David Kellerman - Northlake Software
- Keith Carter - IBM
- Philip Thambidurai - Okidata
- Praveen Kanipakam - Sharp
- Peter Michaleu - Shinesoft
- Bob Broecolo - Kodak

Carl-Uno Manros reviewed the agenda for the day.

Carl-Uno announced that Scott Isaacson will be presenting an overview of IPP at WWW7 in Brisbane in April.

DEVICE-TO-PRINTER PROTOCOL

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Roger deBry presented the "Print Systems Configuration" document which provides a framework of the various configurations of print systems. This document is available in PDF and PPT versions on the PWG FTP server as [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_REQ/printer-flows.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_REQ/printer-flows.pdf) and as [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_REQ/printer-flows.ppt](ftp://ftp.pwg.org/pub/pwg/ipp/new_REQ/printer-flows.ppt). There was significant discussion over the usage and arrangement of various terminologies (e.g. what is a server versus client.)

The group discussed the need for a host-to-printer protocol. Should IPP evolve upwards to provide the functionality of a robust host-to-printer protocol? Does something new need to be created or does something already exist? How much similarity does there need to be between a client-to-server protocol (like IPP) and the device-to-printer protocol.

Paul Moore led and others created a list of the deficiencies in IPP as a host-to-printer protocol:

- 1) IPP is asymmetrical: No way for the printer to generate an alert.
- 2) Today there is no peer conflict resolution in IPP. How does an IPP printer resolve being asked to print by two clients.
- 3) There is no way for the printer to solicit data from the client. For example to throttle data transfers.
- 4) The current security model might be too complex for printer devices.
- 5) Not transport neutral, depends on HTTP.
- 6) Fairly heavy duty.
- 7) No way to move data backwards.
- 8) No separate channel for control while data is being printed.
- 9) Detailed configuration and status not available.
- 10) Feature set of IPP was constrained to support low-end printer implementations.
- 11) No accounting outside of device.
- 12) No resource server
- 13) The data representation may not be sophisticated enough.

Don Wright presented an overview of IEEE Std. 1284.1-1997 to the group as an example of an existing standard for device-to-printer protocol. This presentation is available at <ftp://ftp.lexmark.com/pub/ieee/1284.1/pwg12841.pdf>.

Due to the absence of Jay Martin, David Kellerman and Tom Hastings briefly highlighted the characteristics and capabilities of CPAP. CPAP version 1 was released as an Informational RFC. The CPAP version 2 draft is available on the PWG ftp server. The CPAP specification is available at <ftp://ftp.pwg.org/pub/pwg/cpap/cpap.pdf>

The group discussed the possible courses of action on the device-to-printer protocol. Possibilities include:

- 1) Enhancing IPP, adding access to MIB objects, etc.
- 2) Mapping an enhanced IPP to raw TCP/IP
- 3) adopting/modifying an existing device-to-printer protocol
- 4) A version of IPP for devices that supports a subset of IPP plus device control specific additions

Randy Turner plans to put out a document that adds some of the desired control functionality and maps it to TCP/IP rather than using HTTP.

Don Wright will do a comparison of the IPP attributes and TIP/SI.

Scott Isaacson and Tom Hastings will investigate using an IPP follow-on (aka IPP') to access the MIB in the printer.

TESTING  
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Peter Zehler presented an overview of the testing and verification plan. This document is available on the PWG server as [ftp://www.pwg.org/pub/pwg/ipp/new\\_TES/IPP-Test-Plan-980216.pdf](ftp://www.pwg.org/pub/pwg/ipp/new_TES/IPP-Test-Plan-980216.pdf)

Several work items were identified that could be added to the test plan:

- Test of error codes
  - boundary conditions
  - unsupported operations, etc.

- bad syntax

Peter Zehler will be collecting experience information from the test cycle that could be included as implementation experience. No significant changes were made to the plan based upon discussion.

The group discussed the need for some tools that could make the testing and interoperation verification easier. For example, a special "DIFF" that ignored things like the job id, submission time, etc. Another tool that would be useful would be a print formatter that would take the binary data and convert it into something more human readable.

Right now, the traces are stored on the ftp server as simply an binary files containing the wire transactions.

The meeting recessed at 6:00 PM.

The meeting resumed at 8:35 on March 5, 1997.

Carl-Uno reviewed the agenda for the day. The first topic of discussion was notification.

#### NOTIFICATION

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Roger deBry discussed the requirements of IPP notifications ID which is available on the PWG ftp server as ftp.pwg.org/pub/pwg/ipp/new\_NOT/IPP-notify-980219.txt.

It was pointed out that a delivery means might have different quality of service levels. For example a notification like an SNMP trap might have two qualities of service levels, one that sends the trap just once and another that continues to retry until the requestor receives it. Roger will update the document.

The group discussed the issues of security in the notification space and the possibility of intercepting notification as a way to get around IPP security that would prevent someone from looking at the printers job queue.

Roger will submit an update of the Notification Requirements document to the IETF before March 13th in order to be discussed at the LA IETF meeting.

Randy Turner reviewed the notification work being done in the IFAX/EMAIL working group. First Randy reviewed the existing "delivery status notification" (DSN) and "message disposition notification" (MDN) processes that are used by e-mail (SMTP) today. It had been proposed on the mailing list that IPP use MDN's for IPP job complete notifications.

If we were to use something like the multi-part disposition-notification we would need to include in the machine-readable section information to identify the language of any text strings.

DSN's are described in RFCs 1891-1894 (especially 1894) and MDN's in draft-ietf-receipt-mdn-08.txt.

Randy Turner next reviewed SNMP traps. SNMPv1 traps were unreliable and had not standard way to specify trap destination. In SNMPv3, there are some additions to traps called "informs." Traps are still unreliable in v3 but a standard way to specify destinations for both traps and informs

were added. SNMPv3 "informs" can be reliable. Both "informs" and traps can be secure. SNMPv3 added a Target MIB that specifies destination for traps and "informs":

- names
- transport domain (udp/ip, tcp/ip, ipx, etc.)
- transport address (depends on domain)
- message processing model (V1, V2, V2C, V3)
- security method (e.g. TLS)
- security level (e.g. RC2)
- security name ("fred")
- timeout
- retry count

This is all documented in RFC2273. RFC1908 talks about interoperation between SNMPv3 and SNMPv1. Additionally, the Notification MIB allows the agent to store what traps and informs are sent to which destinations. The group discussed a number of possible ways to use these concepts for notification; however, no direction was set.

Scott Isaacson then reviewed several other notification schemes. His slides will be posted to the PWG ftp server ([ftp://ftp.pwg.org/pub/pwg/ipp/new\\_NOT/events-and-notification-980304.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_NOT/events-and-notification-980304.pdf)). The presentation covered:

- OMG -> IDL and CORBA based
- The Open Group
- Java
- NPDS (uses RPC -- RFC1831/1832)

The group discussed what the IETF would be receptive to in this notification area. SNMPv3 and other means are available out of devices but it doesn't address the scalability issue, i.e. how do a large number of clients get information about a large numbers of printers. The concept discussed is that of an event delivery channel that would collect events from printers and distribute them to interested clients. In the Novell NDPS implementation, registration for events get sent to the printer and forwarded on to the "channel" which distributes the events.

Conceptually, IPP could be used as the registration means and a different protocol could be used to delivery the notification back to the registered client.

Harry Lewis showed a presentation covering IBM's concepts of JOB MIB Traps. Harry Lewis will be posting this presentation in the PWG ftp server in the JMP directory tree.

#### DIRECTORY

Scott Isaacson presented material on the issues of mapping of IPP attributes to a directory schema. This material will be posted to the ftp server([ftp://ftp.pwg.org/pub/pwg/ipp/new\\_DIR/directory-mapping-980304.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_DIR/directory-mapping-980304.pdf)). Scott compared the original IPP schema proposal with SLP and what would be capable using LDAP. Scott will get back with Pete St. Pierre, who wrote the SLP printer mapping, and point out the inconsistencies between IPP and the SLP printer mapping.

#### MODEL DOCUMENT

Scott reviewed a number of comments made to the DL about the model document. There were no technical changes made; several typos were identified and clarified.

The new name for the IPP Protocol Document will be "Internet Printing Protocol/1.0: Encoding and Transport".

ACTION ITEMS:

- \* Tom Hastings and Roger deBry will be doing some work on dictionary syntax.
- \* Tom Hastings will be doing some work on improving the document object and document object attributes for a future version of IPP.
- \* Steve Zilles will write a proposal for adding font support to IPP.

OTHER ISSUES

Peter Zehler has done some work on Automatic Printer Installation. He presented an overview of his thoughts and work in this area. This work has been written up and posted on the PWG ftp server as [ftp://www.pwg.org/pub/pwg/ipp/new\\_INST/ipp-printer-install-980213.pdf](ftp://www.pwg.org/pub/pwg/ipp/new_INST/ipp-printer-install-980213.pdf). There was a lot of discussion about how this could be used. There was a reluctance to add anything to the IPP protocol but rather to create an informational RFC or a "best practices" document that would describe how the features of IPP could be used to do automatic driver installation.

Tom Hastings has written a paper Early Binding Defaulting which was posted to the mailing list [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_MOD/clearer-defaulting.pdf](ftp://ftp.pwg.org/pub/pwg/ipp/new_MOD/clearer-defaulting.pdf) as well as [ftp://ftp.pwg.org/pub/pwg/ipp/new\\_MOD/clearer-defaulting.txt](ftp://ftp.pwg.org/pub/pwg/ipp/new_MOD/clearer-defaulting.txt). After some discussion about boundary conditions and printer cascading effects, Tom will update the document and re-post it to the mailing list. The results of this proposal are probably a significant change to the model and would probably need to be a "Model" change.

IPP has a two hour time slot at the LA IETF meeting on Wednesday, April 1, 1998 from 1PM until 3PM. Any documents to be discussed need to be sent to the IETF editor by 3/13.

The next IPP meeting (outside the LA IETF meeting) will be held April 8/9 in Portland, Or. Details are available from <http://www.pwg.org/chair>.

The meeting adjourned at 5:10PM