The Printer Working Group

IPP Workgroup Session, Day 1

August 28, 2019

PWG IP Policy

- "This meeting is being held in accordance with the PWG Intellectual Property Policy"
    - http://www.pwg.org/chair/membership_docs/pwg-ip-policy.pdf
- TL;DR: Anything you say in a PWG meeting or email to a PWG address can be used in a PWG standard
    - (but please do read the IP policy above if you haven't done so)

Agenda

August 28, 2019 (US Mountain Daylight Time)

When	What
09:00 - 10:15	PWG Plenary
10:15 - 10:30	IPP WG: Status
10:30 - 11:00	IPP WG: IPP Everywhere
11:00 - 11:30	Lunch
11:30 - 13:30	IPP WG: IPP Job and Printer Ext. - Set 3 v2.0
13:30 - 13:45	Break
13:45 - 15:00	IPP WG: IPP Production Printing Ext v2.0

Agenda

August 29, 2019 (US Mountain Daylight Time)

When	What
09:00 - 11:00	IDS WG: Status and Discussion
11:00 - 11:30	Lunch
11:30 - 12:30	IPP WG: IPP Encrypted Jobs and Documents v1.0
12:30 - 13:30	IPP WG: IPP System Service v1.0
13:30 - 13:45	Break
13:45 - 15:00	IPP WG: IPP Enterprise Printing Extensions v2.0 Job Accounting with IPP v1.0

Agenda

August 30, 2019 (US Mountain Daylight Time)

When	What
09:00 - 10:00	IPP WG: Errata Review
10:00 - 11:00	IPP WG: 3D Printing Liaisons and Topics
11:00 - 11:30	Lunch
11:30 - 13:00	IPP WG: 3D Printing Metadata BoF + 3D PDF
13:00 - 13:15	IPP WG: Next Steps

Charter

- Current charter:
  - http://ftp.pwg.org/pub/pwg/ipp/charter/ch-ipp-charter-20170615.pdf
- The Internet Printing Protocol (IPP) workgroup is chartered with the maintenance of IPP, the IETF IPP registry, and support for new clients, network architectures (Cloud, SDN), service bindings for MFDs and Imaging Systems, and emerging technologies such as 3D Printing
- In addition, we maintain the IETF Finisher MIB, Job MIB, and Printer MIB registries, and handle synchronization with changes in IPP

Officers

- IPP WG Co-Chairs:
  - Paul Tykodi (TCS)
  - Ira McDonald (High North)
- IPP WG Secretary:
  - Michael Sweet (Apple)
- IPP WG Document Editors:
  - Ira McDonald (High North) – IPP System Service v1.0
  - Michael Sweet (Apple) – IPP Encrypted Jobs and Documents v1.0, IPP Everywhere v1.1, IPP Everywhere Printer Self-Certification Manual v1.1, Job Accounting with IPP v1.0, IPP System Service v1.0
  - Smith Kennedy (HP Inc.) – IPP Encrypted Jobs and Documents v1.0, IPP Enterprise Printing Extensions v2.0 (EPX), IPP Job and Printer Extensions - Set 3 v2.0 (JPS3)

- PWG Specifications in development:
  - IPP Encrypted Jobs and Documents v1.0   - Interim
  - IPP Everywhere v1.1   - Stable
  - IPP Everywhere Printer Self-Certification Manual v1.1 - Prototype
  - IPP Enterprise Printing Extensions v1.0   - Interim
  - IPP System Service v1.0   - Stable
- IPP Best Practices in development:
  - Job Accounting with IPP v1.0   - Initial
- Recently published:
  - PWG 5100.7-2019: IPP Job Extensions v2.0
  - PWG 5199.10-2019: IPP Authentication Methods v1.0

- Up-to-date pending IANA registrations online:
  - https://www.pwg.org/ipp/ipp-registrations.xml
  - Continue to maintain this in parallel for new specifications
  - Github repository: https://github.com/istopwg/ippregistry

- IPP Everywhere Printer Self-Certifications:
  - https://www.pwg.org/printers
  - 412 printers currently listed
  - Second 1.0 self-certification tools update released in October 2017
  - Third 1.0 self-certification tools update released in November 2018

- IPP Sample Code:
  - Github repository:
    - https://github.com/istopwg/ippsample
  - Fork of CUPS code includes ippeveprinter, ippfind, ippproxy, ippserver, ipptool, ipptransform, and ipptransform3d

IPP Everywhere

- Stable draft of core specification:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeve11-20190827-rev.pdf
- Prototype draft of manual:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeveselfcert11-20190827-rev.pdf
- Beta tools nearing completion:
  - https://github.com/istopwg/ippeveselfcert
- New JSON-based portal:
  - https://beta.pwg.org/printers
- Submission tool for new JSON-based portal
- Proposed schedule:
  - Update 4 for v1.0 tools in Q3 2019
  - Stable drafts and beta tools for v1.1 in Q3 2019

IPP Everywhere Self-Certification

- Resources:
  - http://www.pwg.org/ipp/everywhere.html (for tools/info)
  - https://www.pwg.org/ippeveselfcert (submission form)
  - http://www.pwg.org/printers (printer list)
  - https://github.com/istopwg/ippeveselfcert (Github repo)
- Released v1.0 Update 3 of self-certification tools on November 9th, 2018
  - v1.0 is tracking CUPS 2.2.x (current stable branch)
  - Need an update 4 for another Windows packaging issue and the new JSON submission tool
- v1.1 self-certifications tools on track for Q3 2019
  - v1.1 tracks CUPS 2.3.x (current development branch)
  - Includes new JSON submission tool and test updates

![The Printer Working Group](PWG Logo)

The Printer Working Group

Lunch Break

Resuming at 11:30am MDT

- Current interim draft:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippjobprinterext3v11-20190724-rev.pdf
- Revision of PWG 5100.13-2012:
  - Resolved all reported issues/errata
  - Added message catalog syntax extensions and semantics for "_tooltip" and "_helpurl" (from HELPME best practice draft)
  - Added "soft-proof-icc-profiles" and "print-quality-hints-supported" (from PQI best practice draft)
  - Added extensions to "print-color-mode" and "print-quality" (from PQI best practice draft)
- Proposed schedule:
  - Prototype draft Q4 2019

The Printer Working Group

Break

Resuming at 13:45pm MDT

IPP Production Printing Ext. v2.0

- Current interim draft:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippppx20-20190626-rev.pdf
- Revision of PWG 5100.3-2001:
  - Addressed all issues/errata
  - Finishing attributes have been moved to the IPP Finishings v2.1 specification [PWG5100.1]
  - The "job-account-id", "job-accounting-user-id", "job-sheets-col", and "media-col" attributes have been moved to the IPP Job Extensions v2.0 specification [PWG5100.7]
  - References to the original page overrides draft and attributes have been removed since that specification was withdrawn.
- Proposed schedule:
  - Prototype draft Q4 2019

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IPP Workgroup Session, Day 2

August 29, 2019

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IPP Encrypted Jobs and Docs. v1.0

- Interim draft:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipptrustnoone10-20190418-rev.pdf
- Summary:
  - Goal is to provide end-to-end privacy and data integrity through intermediaries using existing public-key standards
  - Defines new PGP-encrypted IPP message format, associated attributes, and operations
- Proposed schedule:
  - Prototype draft Q4 2019/Q1 2020

IPP System Service (SYSTEM) v1.0

- Current stable draft at:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippsystem10-20190814-rev.pdf
- Combines and implements a concrete IPP binding of the following abstract Semantic Model 2.0 services and objects:
  - PWG 5108.06: System Object and System Control Service
  - PWG 5108.03: Network Resource Service
  - PWG 5109.1: Cloud Imaging Requirements and Model
- Also includes attributes from PWG 5110.1: Hardcopy Device Health Assessment Attributes
- Prototyped in ippsample project, IPP WG Last Call completed
- Proposed Schedule:
  - PWG Last Call in Q3/Q4 2019

The Printer Working Group

Break

Resuming at 13:45pm MDT

IPP Enterprise Printing Extensions v2.0

- Current interim draft:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippepx-20190614-rev.pdf
- Proposed schedule:
  - Prototype draft in Q3/Q4 2019

Job Accounting with IPP v1.0

- Initial draft:
  - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippaccounting10-20190418.pdf
- Best Practice document defining how to support job accounting with existing IPP attributes and functionality
- Discuss:
  - What do existing managed print services do today?
  - How do we migrate to IPP in-band queries?
  - What do we say about collecting job accounting information when the printer doesn't provide it via IPP?
- Roadmap for standards-based job accounting
  - Like the Implementor's Guide, for accounting (good/better/best?)
- Proposed schedule:
  - Prototype draft in Q4 2019/Q1 2020

The Printer Working Group

IPP Workgroup Session, Day 3

August 30, 2019

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13:00 - 13:15	IPP WG: Next Steps

- PWG 5100.1-2017: IPP Finishings v2.1 (FIN)
  - Section 11.1 doesn't mention the "punching-hole-diameter-configured" and "stitching-angle" attributes, and related language, to clarify that punched holes are round and of a particular size, and to define that staples' axis of rotation is around their midpoint and have a particular rotation, to more specifically define the coordinates of the space occupied by the punched holes and staples.

- PWG 5100.6-2003: IPP Page Overrides
  - Add a note to remind people to always support the 'document-numbers' keyword in "overrides-supported" for interoperability reasons.

- PWG 5100.9-2009: IPP Printer State Extensions v1.0
  - Regarding the xxx-recoverable-storage-error keywords for printer-state-reasons, we need to remove the "-error" to conform for the STD 92 rules for printer-state-reasons values (-error means the printer is stopped; the printer may not be stopped for recoverable errors).

- PWG 5100.12-2015: IPP 2.0, 2.1, and 2.2
  - Update references to specifications
- PWG 5100.15-2014: IPP FaxOut Service
  - Abstract says "this standard" instead of "this specification"
  - Clarify that phone lines are considered a "secure medium"
- PWG 5100.16-2015: IPP Transaction-Based Printing Extensions
  - Remove mention of "finishings" attribute in section 4
  - Update rationale in section 3.1 (remove redundancies)
  - Add periods to ends of sentences on page 10
- PWG 5100.18-2015: IPP Shared Infrastructure Extensions
  - Add missing operation attribute definitions/registrations
  - Add reference to RFC 6750 for OAuth
  - Clarify usage of UUIDs for devices, output-device-uuid-supported
  - Add missing table-of-contents links to generated PDF

- PWG 5100.19-2015: IPP Implementor's Guide v2.0
  - Fix job-constraints-supported example in section 5.9
  - Talk about 5xx responses to the Expect header in section 8.2
  - Talk about printer-resolution vs. document resolution
  - Make sure all attribute names are enclosed by double quotes
  - Add diagrams showing authentication (or just reference IPP Authentication Methods BP)
  - Talk about power management and discovery - doing a DNS-SD resolve + query will wake up all printers, vs. just doing a browse and only resolving and querying once selected

3D Printing Topics

- Work to get broader adoption of IPP 3D v1.1 and PWG Safe G-Code Subset v1.0
  - Reach out to vendors - point to IPP sample code
  - Both local printing and cloud
  - Can we develop a GUI client prototype?
- Concrete printing
  - Material types
    - Determine whether other material properties are needed (additives, amount of water, etc.)
  - Other print ticket properties needed?
- Liaisons (next slides)

3D Liaison Discussions

- America Makes
  - https://www.americamakes.us/
- ASTM Committee F42 on Additive Manufacturing Technologies
  - https://www.astm.org/COMMITTEE/F42.htm
- ISO/IEC JTC 1 WG 12 3D Printing and Scanning eCommittee
  - https://isotc.iso.org/livelink/livelink?func=ll&objId=19905763&objAction=browse&viewType=1
  - Participation in the ISO initiative is currently via INCITS (supports US TAG)
  - ISTO working with INCITS to engage with official PWG liaison agreement
  - INCITS also working on "4D printing" (moving parts)
- 3DHEALS (Bioprinting/Healthcare)
  - Paul attended Boston, MA meeting on July 18, 2019
  - https://3dheals.com/boston-annual-summer-event

- 3D PDF Consortium
  - https://www.3dpdfconsortium.org
  - Y.1447 semantics are not fully aligned with PWG semantics
- 3D Concrete Printing Standards Development
  - ACI, ASTM, NIST
  - September 2019 - NIST meeting in Gaithersburg MD
  - November 21-22, 2019 - 1st Int'l Conference on 3D Printing & Transportation - Wash, DC
    - http://www.cvent.com/events/1st-international-conference-on-3d-printing-and-transportation/event-summary-2668ecc14e21461c962dc49841c84aee.aspx
    - Transportation Research Board (high precision manufacturing)
  - July 6-8, 2020 - Digital Concrete 2020 - Eindhoven University, Netherlands
    - https://digitalconcrete2020.com/
- 3MF Consortium
  - https://www.3mf.io

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Lunch Break

Resuming at 11:30am MDT

- The 2D Printing referenced in most PWG Standards involves the use of defined materials, which already exist in the physical world. The printing process effectively applies human recognizable patterns to the already existing materials when they pass through the printer.

- When the PWG adapted its existing IPP printing model for the 3D Printing environment, one of the issues it needed to address was that 3D printers typically use defined raw materials to build an object that did not exist in the physical world until the 3D Printer performed its "printing process" with the raw materials loaded in the printer at that time.

- The process of additive manufacturing via a 3D Printer has historically been viewed with a process intensive lens. Many of the existing standards focus on the control of process steps rather than capturing intent.

- For more than five years, NIST has been working with elements of the US Department of Defense Supply Chain network to define a pathway forward for converting the supply chain from using two dimensional paper based drawings to using a digital thread where intent defined in a digital design (Example: Developed using CAD Software) can be included in subsequent digital representations of the design provided to suppliers.

- ISO 21812:2019 GRAPHIC TECHNOLOGY -- PRINT PRODUCT METADATA FOR PDF FILES -- PART 1: ARCHITECTURE AND CORE REQUIREMENTS FOR METADATA – abstract states the following:

- "The document part metadata in a PDF file that conforms to this document can be used to communicate the intended appearance of print products and their components. Examples of intended use are: direct interpretation within a production process, creation of job tickets such as XJDF, or populating records in an MIS. This document builds on the DPart syntax as specified in ISO 16612–2 (PDF/VT) and ISO 32000–2 (PDF 2.0) which is designed for encoding metadata related to pages or groups of pages in PDF files."

- Discussions have been occurring during the last 18 months around whether the outline used to develop the ISO21812 standard (intent based metadata) could be used to create a new standard defining metadata terms for document interchange involving 3D PDF files.

The Printer Working Group

Next Steps

Next Steps

- IPP Encrypted Jobs and Documents v1.0 (Mike/Smith)
  - Prototype draft in Q4 2019/Q1 2020?
- IPP Enterprise Printing Extensions v2.0 (Smith)
  - Prototype draft in Q3/Q4 2019
- IPP Everywhere and Self-Certification v1.1 (Mike/Smith)
  - Stable working drafts/beta tools in Q3/Q4 2019
- IPP Job and Printer Extensions - Set 3 v2.0 (Smith)
  - Prototype draft in Q3/Q4 2019
- IPP Production Printing Extensions v2.0 (Mike)
  - Prototype draft in Q3/Q4 2019
- IPP System Service v1.0 (Ira/Mike)
  - PWG WG Last Call in Q3 2019
- Job Accounting with IPP v1.0 (Mike)
  - Prototype draft in Q4 2019/Q1 2020

More Information

- We welcome participation from all interested parties
- IPP Working Group web page
  - https://www.pwg.org/ipp/index.html
- Subscribe to the IPP mailing list
  - https://www.pwg.org/mailman/listinfo/ipp
- IPP WG holds bi-weekly phone conferences announced on the IPP mailing list
  - Next conference calls scheduled for Thursday, September 12 and 26, 2019 at 3pm ET