



The Printer Working Group

IPP Workgroup Session, Day 1

May 6, 2020

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 (1/2)



May 6, 2020 (US Eastern Daylight Time)

When	What
10:00 - 11:00	PWG Plenary
11:00 - 11:15	IPP WG: Status
11:15 - 12:00	IPP WG: 3D Printing Liaison Status
12:00 - 12:30	Lunch
12:30 - 13:00	IPP WG: IPP Everywhere
13:00 - 16:30	IPP WG: IPP Driverless Printing Ext v2.0

Agenda (2/2)



May 7, 2020 (US Eastern Daylight Time)

When	What
10:00 - 12:00	IDS WG: Status and Discussion
12:00 - 12:30	Lunch
12:30 - 14:00	IPP WG: IPP Enterprise Printing Extensions v2.0
14:00 - 14:30	IPP WG: Job Accounting with IPP v1.0
14:30 - 14:45	IPP WG: Next Steps



- Current charter:
 - <http://ftp.pwg.org/pub/pwg/ipp/charter/ch-ipp-charter-20170615.pdf>
- *Will be doing a charter update in 2020*
- 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, the PWG MIBs, and handle synchronization with changes in IPP



- **IPP WG Co-Chairs:**
 - Paul Tykodi (TCS)
 - Ira McDonald (High North)
- **IPP WG Secretary:**
 - Michael Sweet (Lakeside Robotics)
- **IPP WG Document Editors:**
 - Michael Sweet (Lakeside Robotics) – IPP Encrypted Jobs and Documents v1.0, IPP Everywhere v1.1, IPP Everywhere Printer Self-Certification Manual v1.1, IPP Production Printing Extensions v2.0, Job Accounting with IPP v1.0
 - Smith Kennedy (HP Inc.) – IPP Driverless Printing Extensions v2.0, IPP Encrypted Jobs and Documents v1.0, IPP Enterprise Printing Extensions v2.0



- **PWG Specifications in development:**
 - IPP Encrypted Jobs and Documents v1.0 - Prototype
 - IPP Everywhere v1.1 - In PWG CfO
 - IPP Everywhere Printer Self-Certification Manual v1.1 - In PWG CfO
 - IPP Enterprise Printing Extensions v2.0 - Interim
 - IPP Driverless Printing Extensions v2.0 - Interim
 - IPP Production Printing Extensions v2.0 - Prototype
- **IPP Best Practices in development:**
 - Job Accounting with IPP v1.0 - Interim
- **Recently published:**
 - IPP Label Printing Extensions v1.0 (registration)
 - PWG 5100.16-2020: IPP Transaction-Based Printing Extensions v1.1



- 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
 - Fourth 1.0 self-certification tools update released in April 2020
- IPP Sample Code:
 - Github repository:
 - <https://github.com/istopwg/ippsample>
 - Fork of CUPS code includes ipp3dprinter, ippeveprinter, ippfind, ippproxy, ippserver, ipptool, ipptransform, and ipptransform3d

Status (3/3)



- Pending Errata:

- PWG 5100.1-2017 (Finishings): 2 issues
- PWG 5100.5-2019 (Document Object): 3 issues
- PWG 5100.6-2003 (Page Overrides): 1 issue
- PWG 5100.9-2009 (Printer State Extensions): 1 issue
- PWG 5100.12-2015 (IPP 2.0, 2.1, and 2.2): 2 issues
- PWG 5100.15-2014 (FaxOut): 2 issues
- PWG 5100.18-2015 (Infrastructure Extensions): 5 issues
- PWG 5100.19-2015 (Implementor's Guide 2.0): 6 issues
- PWG 5107.3-2019 (MFD Alerts v1.1): 1 issue

- In-Progress Errata:

- PWG 5100.3-2001 (Production Printing): 2 issues
- PWG 5100.11-2010 (JPS2 - Enterprise Printing): 4 issues
- PWG 5100.13-2012 (JPS3 - Driverless Printing): 12 issues
- PWG 5100.14-2013 (Everywhere v1.0): 11 issues
- PWG 5100.20-2016 (Everywhere Self-Cert v1.0): 3 issues



3D Printing Liaisons (1/3)

- America Makes & ANSI Additive Manufacturing Standardization Collaborative (AMSC)
 - https://www.ansi.org/standards_activities/standards_boards_panels/amsc/America-Makes-and-ANSI-AMSC-Overview
- ASTM Committee F42 on Additive Manufacturing Technologies
 - <https://www.astm.org/COMMITTEE/F42.htm>
 - New work product WK71395 focused on laser powder bed fusion 3D Printing
- 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)
 - INCITS – PWG liaison agreement needs INCITS Executive Board Approval
 - INCITS also working on "4D printing" (moving parts)
- 3D PDF Consortium + ISO/IEC TC171 WG12 Metadata
 - <https://www.3dpdfconsortium.org>
 - Y14.47 semantics are not fully aligned with PWG semantics
 - ISTO working with 3D PDF Consortium to engage with official PWG liaison agreement



3D Printing Liaisons (2/3)

- Drupa 2020 – PWG scheduled for three presentations
 - Drupa Cube (future of print – 3D Printing) June 20th, 2020
 - https://www.drupa.com/en/Visitors/drupa_Hot_Spots/drupa_cube
 - Drupa 3D Fab+Print Lectures (*June 20th, 2020 & June 22nd, 2020*)
 - <https://am.vdma.org/en/viewer/-/v2article/render/37276908>
- 3D Concrete Printing Standards Development
 - ACI, ASTM, NIST
 - ACI 564 Committee Meetings
 - Spring 2020 in Chicago, IL
 - Fall 2020 in Raleigh, NC
 - March 12, 2020 (tentative) for massive WebEx with PWG and others on concrete printing
 - July 6-8, 2020 - Digital Concrete 2020 - Eindhoven University, Netherlands
 - <https://digitalconcrete2020.com/>



3D Printing Liaisons (3/3)

- Healthcare 3D Printing & Bioprinting
 - Attending Additive Manufacturing Strategies 2020 – The Business of 3D Printing: Medicine, Dentistry and Metals – *Feb 11th & 12th, 2020 in Boston, MA*
 - Attending 3DHEALS Boston - Design for Healthcare 3D Printing and Bioprinting – March 18th, 2020
 - Submitted Presentation Abstract for ARMI | BIOFABUSA SPRING SUMMIT: Meeting in the Millyard 2020 – *May 20th & 21st, 2020 in Manchester, NH*
 - RAPID+TCT Tradeshow - *April 19th to April 23rd, 2020 in Anaheim, CA*
 - ASME AM Medical Additive Manufacturing & 3D Innovations – *May 27th & 28th, 2020 in Minneapolis. MN*
 - https://event.asme.org/AM-Medical?_ga=2.106579136.2109177329.1581010631-1170165851.1578507399
- 3MF Consortium
 - <https://www.3mf.io>



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Lunch Break

Resuming at 12:30 EST

IPP Everywhere



- PWG Call for Objections ends May 15, 2020:
 - URL for CfO of IPP Everywhere
 - URL for CfO of IPP Everywhere Self-Cert Manual
- Stable draft of core v1.1 specification:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeve11-20200417-rev.pdf>
- Stable draft of v1.1 manual:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeveselfcert11-20200312-rev.pdf>
- Release candidate v1.1 tools:
 - <https://github.com/istopwg/ippeveselfcert>
- New JSON-based portal is online:
 - <https://www.pwg.org/printers>



IPP Everywhere Self-Certification

- Resources:
 - <https://www.pwg.org/ipp/everywhere.html> (for info)
 - <https://www.pwg.org/ippeveselfcert> (tools and submission instructions)
 - <https://www.pwg.org/printers> (printer list)
 - <https://github.com/istopwg/ippeveselfcert> (Github repo)
- Released v1.0 Update 4 of self-certification tools on April 8th, 2020
 - v1.0 is tracking CUPS 2.2.x (previous stable branch)
- Release candidate v1.1 self-certifications tools available
 - v1.1 tracks CUPS 2.3.x (current stable branch)



IPP Driverless Printing Ext v2.0

- Current interim draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippnodriver20-20200204-rev.pdf>
- Updates PWG 5100.13-2012: IPP Job and Printer Extensions - Set 3 (JPS3)
- Discussion:
 - Margin Elimination Functionality
 - "print-quality" Extensions
- Proposed schedule:
 - Prototype draft in Q3 2020



Margin Elimination Functionality

- <https://github.com/istopwg/ippsample/wiki/Roll-Feed-Printing-Extensions:-eliminate-margins>
- First pass: "eliminate-margins (type2 keyword)":
 - "all", "banner", "none"
- Second pass: Add "imposition-template (type2 keyword)" keywords:
 - "banner" to eliminate margins/whitespace between pages
 - "compressed" to eliminate all margins/whitespace



"print-quality" Extensions

- <https://github.com/istopwg/ippsample/wiki/IPP-Print-Quality-Discussion>
- First pass: Add enum values for different "print-quality" types
 - Issue: Proposed values make it difficult for Clients to present understandable UI - the current values map easily to a slider (draft to best) while the new values include non-contiguous, vendor-specific quality levels
- Second pass: Add "print-quality-percent (integer(0:100))" to provide greater precision from worst-to-best quality
 - Issue: Provides more control over a contiguous range of quality levels, but doesn't support vendor quality modes
- Third pass: Add "print-quality-col (collection)" to provide named templates, "quality-percent (integer(0:100))", and clear mapping from old enums to new templates



"print-quality-col (collection)"

- "quality-template" (type2 keyword | name(MAX)): REQUIRED name of the print quality level. 'draft', 'normal', and 'high' directly map to the "print-quality" enum values.
- "quality-percent" (integer(0:100)): RECOMMENDED relative quality level to support slider-style print quality selection. 'draft' = 25, 'normal' = 50, 'high' = 75.
- "quality-colorants" (type2 keyword): Colorants used for printing - 'all', 'black', 'cmy', 'cmyk'?
- "quality-color-accuracy" (type2 keyword): 'best', 'fast', 'normal'?
- "quality-resolution" (resolution): Minimum resolution required (2D only).
- "quality-image-sampling" (type2 keyword): 'auto', 'best', 'nearest-neighbor', 'bilinear', 'bicubic', etc.
- "quality-dimensional-accuracy" (collection): Minimum accuracy required in nanometers (3D only).
- "quality-strength" (integer(0:MAX)): Tensile strength in kilopascals (kPA) (3D only).
- Other member attributes?



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IPP Workgroup Session, Day 2

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14:30 - 14:45	IPP WG: Next Steps

IPP Enterprise Printing Extensions v2.0



- Current interim draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippepx20-20191010-rev.pdf>
- Update of PWG 5100.11-2010: IPP Job and Printer Extensions - Set 2 (JPS2)
 - Dropped job-save-disposition, replacing it with new Job Storage feature
 - Dropped pages-per-subset, replaced by job-pages-per-subset in 5100.1
 - Dropped sheet-collate (base attribute from RFC 3381 is obsolete)
 - Some non-enterprise-specific attributes were moved to PWG 5100.7
- Proposed schedule:
 - Prototype draft in Q3 2020



Job Accounting with IPP v1.0

- Interim draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippaccounting10-20200129.pdf>
- Best Practice document defining how to support job accounting with existing IPP attributes and functionality
 - Like the Implementor's Guide but for standards-based job accounting
- Proposed schedule:
 - Prototype draft in Q3 2020



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Next Steps



Next Steps

- IPP Encrypted Jobs and Documents v1.0 (Mike/Smith)
 - Prototyping late 2020/early 2021?
- IPP Enterprise Printing Extensions v2.0 (Smith)
 - Prototype draft in Q3 2020
- IPP Everywhere and Self-Certification v1.1 (Mike/Smith)
 - PWG Call for Objections ends May 15, 2020
- IPP Driverless Printing Extensions v2.0 (Smith)
 - Prototype draft in Q3 2020
- IPP Production Printing Extensions v2.0 (Mike)
 - Stable draft in Q4 2020
- Job Accounting with IPP v1.0 (Mike)
 - Prototype draft in Q3 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, May 21 and June 4, 2020 at 3pm ET