



The Printer Working Group

Lunch Break

May 17, 2023

OpenPrinting resuming at 12:45pm ET



The Printer Working Group

IPP Workgroup Session

May 17, 2023



Before We Begin...

- PWG Antitrust Policy:
 - https://www.pwg.org/chair/membership_docs/pwg-antitrust-policy.pdf
 - The IEEE-ISTO Printer Working Group ("PWG") will not become involved in the business decisions of its Members. The PWG strictly complies with applicable antitrust laws. Every PWG meeting attendee shall comply with this policy. The PWG Officers and PWG Workgroup Officers are responsible to ensure that this policy is adhered to in all PWG activities.
- PWG Intellectual Property Policy:
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 - TL;DR: Anything you say in a PWG meeting or email to a PWG address can be used in a PWG Document
 - (but please do read the IP policy above if you haven't done so)
- **This meeting is being recorded to assist in preparation of minutes but will not be published**

Agenda (1/2)



May 17, 2023 (US Eastern Daylight Time)

When	What
10:00 - 11:00	OpenPrinting: CUPS Plenary
11:00 - 12:00	OpenPrinting: Printer Applications
12:00 - 12:45	Lunch Break
12:45 - 13:45	OpenPrinting: Other Projects
13:45 - 14:15	IPP WG: Status
14:15 - 14:45	Break
14:45 - 15:00	IPP WG: 3D Liaisons
15:00 - 15:30	IPP WG: PWG Media Standardized Names v2.1
15:30 - 16:00	IPP WG: Evolution of IPP/2.x and IPP Everywhere

Agenda (2/2)



May 18, 2023 (US Eastern Daylight Time)

When	What
10:00 - 12:00	IDS WG
12:00 - 12:45	Lunch Break
12:45 - 13:15	IPP WG: 3D Discussions (change)
13:15 - 14:45	IPP WG: IPP OAuth Extensions v1.0
14:45 - 15:00	IPP WG: Next Steps



- Current charter:
 - <https://ftp.pwg.org/pub/pwg/ipp/charter/ch-ipp-charter-20210409.pdf>
- The Internet Printing Protocol (IPP) workgroup is chartered with the maintenance of IPP and the IETF IPP registry, and support for new clients, network architectures (Cloud, SDN), MFD/Imaging service bindings, and emerging technologies such as 3D Printing
- In addition, we maintain the IETF Finisher MIB, Job MIB, and Printer MIB registries, the PWG MIBs, the PWG Semantic Model schema, and handle synchronization with changes in IPP
- **Due for an update**



- **Pending:**

- PWG 5100.5-2019 (Document Object v1.1): 4 issues
- PWG 5100.6-2003 (Page Overrides v1.0): 2 issues
- PWG 5100.8-2003 ("-actuals" v1.0): 1 issue
- PWG 5100.9-2009 (Printer State Extensions v1.0): 2 issues
- PWG 5100.15-2014 (FaxOut v1.0): 2 issues
- PWG 5100.18-2015 (Infrastructure Extensions v1.0): 8 issues
- PWG 5100.19-2015 (Implementor's Guide v2.0): 8 issues
- PWG 5100.22-2019 (System Service v1.0): 3 issues
- PWG 5107.3-2019 (MFD Alerts v1.1): 1 issue

- **In-Progress:**

- PWG 5100.11-2010 (JPS2 - Enterprise Printing): 7 issues
- PWG 5100.12-2015 (IPP 2.0, 2.1, and 2.2): 2 issues
- PWG 5100.14-2020 (IPP Everywhere v1.1): 4 issues
- PWG 5100.20-2020 (IPP Everywhere v1.1 Self-Cert): 1 issue
- PWG 5101.1-2013 (PWG Media Standardized Names v2.0): 6 issues



Discussion: JSON Encoding of IPP

- Google proposal:
 - <https://pwg.org/pipermail/ipp/2023/021387.html>
- Goal is to formalize the ad-hoc encodings provided by open source Javascript libraries:
 - <https://github.com/williamkapke/ipp>
 - <https://github.com/sealsystems/node-ipp>
- Benefit is to allow more control over printing for browser-based applications
- Can probably develop a CDDL 1.0 schema

PWG Media Standardized Names v2.1



- Interim Draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-pwgmsn21-20230428-rev.pdf>
- Errata Update of PWG 5101.1-2013: PWG Media Standardized Names v2.0 (MSN2)
 - Addresses all reported issues
 - Adds media names that have been registered since 2013
- Proposed Schedule:
 - Prototype draft Q3 2023



IPP/2.x Fourth Edition

- Current interim draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippbase23-20220809-rev.pdf>
- Errata update of PWG 5100.12-2015:
 - Clarification about Get-Printer-Attributes operation
 - Definition of classes or categories of printers
 - Updated document references, including an informative reference to IPP Everywhere
 - Simplified reference tables and conformance requirements
 - New history of the development of the Internet Printing Protocol content to explain how we ended up with different protocol versions with the same encoding
- Proposed schedule:
 - Prototype draft after EPX 2.0

IPP Everywhere v2.0



- Current prototype draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeve20-20221107-rev.pdf>
- Major update of PWG 5100.14-2020: IPP Everywhere v1.1
 - Most RECOMMENDED items become REQUIRED
 - New CONDITIONALLY REQUIRED items
 - REQUIRE "printer-firmware-xxx" Printer Status attributes
 - REQUIRE Get-Printers from PWG 5100.22 for print servers
 - RECOMMEND IPP-USB support
- Discussion:
 - Add HTTP Date: header requirements (see next slide)
 - Add Wi-Fi configuration attributes for IPP-USB?
- Proposed schedule:
 - Stable draft Q3/Q4 2023



HTTP Date: Header

- Some other IPP-based print standards require the Date: header to allow Clients to provide an initial date/time to a Printer
- Useful for Printers that lack a battery-backed real time clock
- Something along the lines of:
 - Clients SHOULD provide the HTTP "Date" header with the current date and time when sending requests to a Printer. Printers can then support setting of their realtime clock using the HTTP "Date" header in IPP requests if their clock is not already initialized.



Wi-Fi Configuration

- Some other IPP-based print standards support Wi-Fi configuration over IPP-USB
 - Useful for joining a printer to a Wi-Fi network
- New Printer attributes:
 - printer-wifi-password (octetString(MAX))
 - printer-wifi-ssid (name(MAX))
 - printer-wifi-state (type2 enum)
- Is there interest in adopting this?

IPP Everywhere Printer Self-Certification Manual v2.0



- Initial draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeveselfcert20-20220510.pdf>
- Major update to PWG 5100.20-2020
 - Synchronize with changes in IPP Everywhere v2.0
 - Add IPP-USB support (particularly for USB-only printers)
 - Add feature tests for duplex, finishings, roll, tray
 - Add Get-Printers test for servers
- Proposed schedule:
 - Prototype draft and beta tools Q3/Q4 2023

IPP Everywhere™ v2.0 Printer Self-Certification Tests



- Existing tests:
 - mDNS/DNS-SD - required service types, TXT keys, and values
 - IPP - required operations, attributes, and values, 'media-needed'
 - Document - basic printing tests for PWG Raster, JPEG, and PDF
- New tests:
 - Color printing - verify print-color mode works to switch between color and grayscale for PWG Raster, JPEG, and PDF
 - Duplex printing - verify odd number of pages works, PWG Raster, JPEG (fail/ignore), PDF
 - Stapling, Folding, Punching - verify all supported staple values work for PWG Raster, JPEG, and PDF with different numbers of pages, duplex modes (as supported)
 - Trimming/cutting - verify cutter works for roll media (as supported)
 - Server - verify Get-Printers operation works, do IPP tests against each reported printer
- JPEG and PDF tests only performed if the Printer supports them



Self-Certification Tools

- **Platforms:**
 - Linux: Distribute as free app via snapcraft for Intel and ARM
 - macOS: 10.14+, distribute as free app via Mac AppStore for Intel and Apple Silicon
 - Windows: 10+, distribute as free app via Windows Store for Intel
- Command-line and GUI front-end (rather than running individual scripts)
- Potential issues with using ISTO as publishing vendor
 - Maybe have one PWG member publish the official apps instead?



Self-Certification Tools (con't)

- "ippevetool"
 - GUI and command-line
 - Run self-certification tests
 - Inspect TXT records, Printer attributes, resources (icon/profile/string), and X.509 certificates
 - Do ad-hoc print tests using canned and/or user-supplied files
 - Do ad-hoc ipptool tests using canned and/or user-supplied files
 - Look-up specs for attributes and values via IPP registry
- Github repository:
 - <https://github.com/istopwg/ippeveselfcert>
 - "flutter" branch has current work-in-progress



Self-Certification Tools (con't)

- Implementing front-end using Flutter (GUI) and Dart (language)
 - One code base for all platforms
 - Compiles to native code
 - Potential for supporting Android, *BSD, and iOS/iPadOS
 - Existing "nsd" mDNS/DNS-SD library can be used for Android, iOS/iPadOS, macOS, and Windows
 - Need to write Avahi nsd plugin ("nsd_avahi") for Linux/*BSD
 - Need to implement proper IPP library for Dart
- Back-end uses ipptool from libcups project:
 - <https://github.com/OpenPrinting/libcups>



Self-Certification Tools (con't)

IPP Everywhere™ Tool

- Canon TS5100 series
- DYMO LabelWriter 450 Twin Turbo
- EPSON SC-P800 Series
- EPSON WF-7520 Series
- HP OfficeJet Pro 8030 series [692825]
- HP Officejet Pro X576dw MFP [3483FE]
- Lexmark MC3426adw
- Rollo X1040
- Zebra GX420d
- Zebra GX430t

IPP Everywhere™ Tool

← HP Officejet Pro X576dw MFP [3483FE]

Overview IPP Attributes Print File Self-Certification



State: idle, accepting jobs, cover-open
Location: Mike's Office
Make and Model: HP Officejet Pro X576dw MFP
Firmware: LZPICN2022AR

DNS-SD TXT Record:

Name	Value
txtvers	1
qttotal	1
pdl	application/vnd.hp-PCL,application/vnd.hp-PCLXL,application/postscript,application/pdf,image/jpeg,application/PCLm,image/urf
rp	ipp/print
PaperMax	legal-A4
kind	document, envelope, photo, postcard
URF	CPJ,MTI-2-8-9-10-11,PQ3-4-5,RS300-600,SRGB24,OBIO,w8,DEVW8,DEVRGB24,ADOBERGB24,DM3,JSI9-1-2,V1.4
ty	HP Officejet Pro X576dw MFP
product	(HP Officejet Pro X576dw MFP)
usb_MFG	HP
usb_MDL	HP Officejet Pro X576dw MFP
adminurl	http://HPFC15B43483FE.local/#hld-pgAirPrint

IPP Everywhere™ Tool

← HP Officejet Pro X576dw MFP [3483FE]

Overview IPP Attributes Print File Self-Certification

Checklist: Production-ready firmware
 Firmware update required
 Print server
 Output was correct

Model Names: Model 1
Model 2
Model 3
...
Model N

Product Family:

Product Webpage:

Self-certification results appear here



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14:45 - 15:00	IPP WG: Next Steps



3D Printing and Scanning Discussions

- Current documents:
 - PWG 5100.21-2019: IPP 3D Printing Extensions v1.1
 - PWG 5199.5-2017: PWG 3D Print Job Ticket and Associated Capabilities v1.0 (PJT3D)
 - PWG 5199.7-2019: PWG Safe G-Code Subset for 3D Printing v1.0
- Proposed future work (2023-2024):
 - IPP 3D Scan Service v1.0 specification to address 3D scanning
 - IPP 3D Production Printing Extensions v1.0 specification to address VDMA - OPC UA "Joint Working Group (JWG) for Additive Manufacturing" efforts
 - Updated PWG 3D Print Job Ticket and Associated Capabilities v2.0 (PJT3D) best practice to incorporate production extensions and IPP 3D v1.1
 - Create sample 3MF print files with embedded job tickets, do more IPP 3D prototyping

3D Printing Liaisons



- Have a new liaison agreement with the 3MF Consortium
 - Want to create some sample 3MF print files with embedded job tickets and do more IPP 3D prototyping
 - Collaborate with 3MF and AMSC to use IPP 3D to satisfy need to query device capabilities and securely submit content for printing
- VDMA OPC UA for Additive Manufacturing - Joint Working Group 40 540
 - <https://www.vdma.org/events-trade-fairs/-/event/view/70649>
 - Paul Tykodi is representing the PWG in the activities of the Joint Working Group. The JWG has a potential interest in referencing IPP 3D standard for secure remote job submission

3D Meetings



- The ASTM International Conference on Additive Manufacturing (ICAM 2023): October 30 - November 3, 2023 in Washington, DC:
 - <https://amcoe.org/event/icam2023/>
 - Plan to attend in person
- Formnext: November 6-10, 2023 in Frankfurt, Germany
 - Additive Manufacturing Standards Forum: November 6
 - Frankfurt Am Main Germany: November 7-10
 - If IPP 3D OPC UA efforts proceed to Proof of Concept in conjunction with umati (<https://umati.org/>), plan to attend in person



- Current draft:
 - <https://www.ansi.org/news/standards-news/all-news/2023/05/5-1-23-draft-standardization-roadmap-for-additive-manufacturing-version-3-released-for-comment>
- Proposed to delete:
 - Pg 134: Gap PC5: Parameter Control
 - Pg 141: Gap PC13: Flow Parameters for Material Jetting
 - Pg 169: Gap P4: Surface Texture (Surface Finish)
- Keep:
 - Pg 45: Gap DE8: Machine Input and Capability Report (Should we add 3MF - IPP Comment?)
 - Pg 69: Gap DE20: Neutral Build File Format
 - Pg 125: Gap PC1: Digital Format and Digital System Control
 - Pg 129: Gap PC3: Machine Health Monitoring
 - Pg 146: Gap PC15: Configuration Management
 - Pg 237: Gap QC3: Harmonizing Q&C Terminology for Process Parameters
 - Pg 357: Gap DA18 (formerly M7 in V2): Additive Manufacturing Supply Chain Security (Should we add a Common Criteria comment?)



IPP OAuth Extensions v2.0 (OAUTH)

- Interim Draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippoauth10-20230515-rev.pdf>
- Goals:
 - Define/reference best practices for using OAuth/OpenID with IPP
 - Prototype/deploy OAuth/OpenID support for printing
- Proposed Schedule:
 - Prototype draft Q4 2023



The Printer Working Group

Next Steps



Next Steps

- IPP/2.x Fourth Edition (Mike)
 - Prototype draft in Q3/Q4 2023
- IPP Encrypted Jobs and Documents v1.0 (Mike/Smith)
 - Stable draft in Q1 2024
- IPP Enterprise Printing Extensions v2.0 (Smith)
 - Stable draft in Q2/Q3 2023
- IPP Everywhere v2.0 (Mike)
 - Stable draft in Q3/Q4 2023
- IPP Everywhere Printer Self-Certification Manual v2.0 (Mike)
 - Prototype draft in Q3/Q4 2023
- IPP OAuth Extensions v1.0 (Mike/Piotr)
 - Prototype draft in Q4 2023
- PWG Media Standardized Names v2.1 (Mike)
 - Prototype draft in Q3 2023



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, June 1 and 15, 2023 at 3pm ET