



The Printer Working Group

IPP Workgroup Session, Day 1
August 15, 2018

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)



August 15, 2018 (Mountain Daylight Time)

When	What
09:00 - 10:00	PWG Plenary
10:00 - 10:30	IPP WG: Status
10:30 - 11:00	IPP WG: IPP Everywhere v1.1
11:00 - 12:00	Break / Lunch
12:00 - 12:30	IPP WG: IPP Job Reprint Password
12:30 - 14:00	IPP WG: IPP System Service



August 16, 2018 (Mountain Daylight Time)

When	What
09:00 - 10:30	IDS WG: Status and Discussion
10:30 - 11:00	IPP WG: TLS 1.3, IPP Authentication Methods
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12:00 - 12:30	IPP WG: IPP Authentication Methods (con't)
12:30 - 13:45	IPP WG: IPP 3D v1.1, PWG Safe G-Code, PWG/ AMSC / ISO 3D Discussion
13:45 - 14:00	IPP WG: Next Steps



- 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



- **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
 - Michael Sweet (Apple) – How to Use the Internet Printing Protocol, IPP 3D Printing Extensions v1.1, IPP Encrypted Jobs and Documents, IPP Everywhere v1.1, IPP Everywhere Printer Self-Certification Manual v1.1, IPP System Service, PWG Safe G-Code
 - Smith Kennedy (HP Inc.) – How to Use the Internet Printing Protocol, IPP Authentication Methods, IPP Encrypted Jobs and Documents, IPP Job Reprint Password
 - Peter Zehler (Xerox) - How to Use the Internet Printing Protocol

Status (1/3)



- PWG Specifications in development:
 - IPP 3D Printing Extensions v1.1 - Prototype Draft
 - IPP Everywhere v1.1 - Prototype Draft
 - IPP Everywhere Printer Self-Certification Manual v1.1 - Prototype Draft
 - IPP System Service v1.0 - Prototype Draft
- IPP Registration Documents in development:
 - IPP Job Reprint Password - Stable Draft
- IPP Best Practices in development:
 - IPP Authentication Methods - Interim Draft
 - IPP Encrypted Jobs and Documents - Interim Draft
 - PWG Safe G-Code Subset for 3D Printing - Stable Draft
- IPP Book in development:
 - How to Use the Internet Printing Protocol - Interim Draft

Status (2/3)



- Recent IPP WG Approved Documents:
 - "IPP Get-User-Printer-Attributes" Registration
 - "IPP Presets" Registration
 - "Supporting Multi-Purpose Trays" Best Practice
 - "IPP Privacy Attributes" Registration
- Recent PWG Approved Documents:
 - PWG 3D Print Job Ticket and Associated Capabilities v1.0 (PJT3D)
 - PWG 5100.1-2017: IPP Finishings 2.1 (FIN)
 - PWG 5100.21-2017: IPP 3D Printing Extensions v1.0 (3D)
- Recent IETF RFCs:
 - RFC 8010: Internet Printing Protocol/1.1: Encoding and Transport
 - RFC 8011: Internet Printing Protocol/1.1: Model and Semantics
 - STD 92: Internet Printing Protocol/1.1 (RFCs 8010 and 8011)



- Up-to-date pending IANA registrations online:
 - <http://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>
 - 272 printers currently listed (more than doubled since August 2017)
 - Second 1.0 self-certification tools update released in October 2017
 - *Third 1.0 self-certification tools update in testing*
- IPP Sample Code:
 - Github repository:
 - <https://github.com/istopwg/ippsample>
 - Fork of CUPS code includes ippfind, ippproxy, ippserver, ipptool, ipptransform, and ipptransform3d



- Test file projects are identifying multiple issues:
 - Technical errata for RFC 3996 and PWG 5100.7
 - ippserver/ipptransform bugs being tracked in new Conformance project:
 - <https://github.com/istopwg/ippsample/projects/6>
 - ipptool bugs:
 - "EXPECT foo IN-GROUP bar" didn't handle attributes that might appear in multiple groups
 - "WITH-VALUE" did not support octetString values
 - Also new ipptool enhancements being tracked for rangeOfInteger testing and sub-tests to automate testing of multiple (supported) values



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 2 of self-certification tools on October 13th, 2017
 - v1.0 is tracking CUPS 2.2.x (current stable branch)
 - Update 3 in testing to fix minor issues and Windows packaging, new sample raster files
- Planning future 1.1 errata update for manual and tools in 2018
 - v1.1 will track CUPS 2.3.x (current development branch)

IPP Everywhere v1.1



- Prototype drafts:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeve11-20180704-rev.pdf>
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeveselfcert11-20180704-rev.pdf>
- Proposed schedule:
 - Stable drafts and beta tools Q3/Q4 2018



Self-Certification 1.1 Update

- Tool changes:
 - Align with conformance requirements in v1.1 spec
 - More tests for required operations: Cancel-My-Jobs, Close-Job, Identify-Printer
 - New OS requirements
 - Linux: Ubuntu LTS 18.04
 - macOS: 10.13 or later
 - Windows: 7 or later
- Portal changes:
 - Track implementation type: logical device (server) vs. physical device (printer)
 - Track specific capabilities (type of finishers, etc.)
 - Existing submissions will be updated by hand (only 2 have finishers, all are printers)



The Printer Working Group

Lunch Break

Resuming at 12pm MT



IPP Job Reprint Password

- Interim draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippreprintpwd-20180620-rev.pdf>
- Proposed schedule:
 - IPP WG Last Call ASAP



IPP System Service (SYSTEM)

- Current prototype draft at:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippssystem10-20180701-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
- Proposed Schedule:
 - Stable draft in Q4 2018



The Printer Working Group

IPP Workgroup Session, Day 2

August 16, 2018

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- Lots of confusion over this new version of TLS
 - Still waiting for RFC publication...
 - Clients and Printers SHOULD start supporting TLS 1.3 as soon as possible
- IPP Everywhere™ v1.1 adds "1.3" version to the TLS key in the TXT record to allow a Client to discover the maximum TLS version a Printer supports without connecting
 - ... but the only way to know for sure is to negotiate a TLS connection since the DNS-SD TXT record could be spoofed
- No IPP attributes or values for TLS 1.3
 - Most IPP Clients are looking for _ipps advertisements (TLS) and not for a specific version of TLS
 - TLS version negotiation is handled separate from IPP just as DNS-SD is a discovery mechanism separate from IPP



IPP Authentication Methods

- Current white paper:
 - <https://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ippauth-20180629-rev.pdf>
- Provides an overview of how HTTP authentication methods are used with IPP
 - Currently HTTP Basic, HTTP Digest, HTTP Bearer (OAuth 2.0), HTTP Negotiate (Kerberos), TLS Client Certificate
 - Maybe HTTP MutualAuth and others in the future



The Printer Working Group

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Resuming at 12pm MT



IPP Authentication Methods (con't)

- What to discuss in the second half?
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IPP 3D Printing Extensions v1.1

- Prototype draft:
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipp3d11-20180704-rev.pdf>
- Errata update to address specific implementation issues on entry-level 3D printers and enable support for generic cloud/local slicing services
- Proposed schedule:
 - Stable draft Q4 2018

PWG Safe G-Code Subset for 3D Printing



- **Stable draft:**
 - <https://ftp.pwg.org/pub/pwg/ipp/wd/wd-pwgsafegcode10-20180704-rev.pdf>
- **Best Practice document that defines a common subset of G-Code for FDM printers**
 - Convenient format for adoption by existing 3D printers
 - Targeting only as a best practice document because G-Code isn't an ideal long-term intermediate format
- **Discussion:**
 - Other G-Code commands required?
 - Other Printer Description or Job Template attributes required?
- **Proposed schedule:**
 - IPP WG Last Call Q4 2018



IPP 3D Liaison Discussions

- ASTM Committee F42 on Additive Manufacturing Technologies
 - www.astm.org/COMMITTEE/F42.htm
- IEEE Consumer 3D Printing Working Group (P3030)
 - standards.ieee.org/develop/wg/C3DP.html
- ISO/IEC JTC 1 3D Printing and Scanning Study Group
 - www.iso.org/committee/45020.html
- 3D PDF Consortium
 - www.3dpdfconsortium.org
- 3MF Consortium
 - www.3mf.io
- Press requests
 - "3D Printing Industry" web site: www.3dprintingindustry.com



The Printer Working Group

Next Steps



Next Steps (con't)

- IPP Authentication Methods (Smith)
 - Continue developing as best practice
- IPP Job Reprint Password (Smith)
 - IPP WG Last Call
- "How to Use the Internet Printing Protocol" Book (Mike/Pete/Smith)
 - Publish stable version ASAP, post updates as needed
- IPP System Service (Ira/Mike)
 - Stable working draft in Q4 2018
- IPP Everywhere and Self-Certification v1.1 (Mike/Smith)
 - Stable working drafts/beta tools in Q4 2018



Next Steps (con't)

- IPP 3D Printing Extensions v1.1 (Mike)
 - Stable draft in Q4 2018
- PWG Safe G-Code Subset for 3D Printing (Mike)
 - IPP WG Last Call in Q4 2018
- MFD Alerts v1.1 (Ira/Mike/Smith - Errata Update)
 - Initial working draft in Q3/Q4 2018
- IPP Encrypted Jobs and Documents (Mike/Smith)
 - Prototype draft in Q1 2019



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, August 30 and September 13, 2018 at 3pm ET