



The Printer Working Group

IPP Workgroup Session, Day 1

April 27, 2016

PWG F2F Meeting

Boise, ID (HP)



April 27, 2016

When	What
1:00 - 1:15	IPP Workgroup Status
1:15 - 5:00	IPP System Service

April 28, 2016

When	What
9:00 - 12:00	IPP 3D Printing Extensions
12:00 - 1:00	Lunch
1:00 - 2:00	IPP Finishings 2.1
2:00 - 2:30	Proposals
2:30 - 3:00	Next Steps



- Current charter:
 - <http://ftp.pwg.org/pub/pwg/ipp/charter/ch-ipp-charter-20151225.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 (SYSTEM), IETF IPP/1.1
 - Michael Sweet (Apple) – IPP System Service (SYSTEM), IETF IPP/1.1, IPP 3D Printing Extensions
 - Smith Kennedy (HP Inc.) – IPP Finishings 2.1

Status (1/3)



- IETF RFCs in development:
 - IETF IPP/1.1: Encoding and Transport (obsoletes RFC 2910/3382)
 - Stable Draft, AD Sponsor
 - IETF IPP/1.1: Model and Semantics (obsoletes RFC 2911/3381/3382)
 - Stable Draft, AD Sponsor
- PWG Specifications in development:
 - IPP 3D Printing Extensions (3D) - Interim Draft
 - IPP System Service (SYSTEM) - Interim Draft
 - IPP Finishings 2.1 (FIN) - Interim Draft

Status (2/3)



- **Recent Full Standard:**
 - PWG 5100.12-2015: IPP 2.0, 2.1, and 2.2
- **Recent Candidate Standards:**
 - PWG 5100.20-2016: IPP Everywhere Printer Self-Certification Manual v1.0 (SELFCERT)
 - PWG 5100.19-2015: IPP Implementor's Guide v2.0 (IG)
 - PWG 5100.18-2015: IPP Shared Infrastructure Extensions (INFRA)
- **Recent IETF RFCs:**
 - RFC 7612: LDAP Schema for Printer Services
 - RFC 7472: IPP over HTTPS Transport Binding and "ipps" URI Scheme



- 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:
 - Submission page:
 - <https://www.pwg.org/ippeveselfcert>
 - Printer listing page:
 - <https://www.pwg.org/printers>
 - Still waiting for our first submission!
- IPP Sample Code:
 - Github repository:
 - <https://github.com/istopwg/ippsample>
 - Fork of CUPS code includes ippfind, ippproxy, ippserver, and ipptool



IETF IPP/1.1 Updates

- Developing two new RFCs to replace (obsolete) RFCs 2910, 2911, 3381 (deprecated job progress attributes), and 3382 (collection attribute syntax)
- Stable drafts:
 - <http://tools.ietf.org/html/draft-sweet-rfc2910bis>
 - <http://tools.ietf.org/html/draft-sweet-rfc2911bis>
 - *Drafts are being AD-sponsored by Barry Leiba, IETF ART Director, for publication as IETF Proposed Standard*
 - *RFCs will eventually be advanced to IETF Internet Standard through status change (IETF process)*
- Proposed schedule:
 - IETF Last Call - Q2/Q3 2016
 - IESG Approval - Q3/Q4 2016



IPP System Service (SYSTEM)

- Current interim draft at:
 - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippssystem10-20160228-rev.pdf>
- Proposed Schedule:
 - Prototype draft in Q2/Q3 2016



The Printer Working Group

IPP Workgroup Session, Day 2

April 28, 2016

PWG F2F Meeting

Boise, ID (HP)

Agenda



April 27, 2016

When	What
1:00 - 1:15	IPP Workgroup Status
1:15 - 5:00	IPP System Service

April 28, 2016

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IPP 3D Printing Extensions

- Current draft (interim):
 - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipp3d10-20160420-rev.pdf>
- Proposed schedule:
 - Prototype draft (content complete) Q3 2016
- Items for discussion (next slides):
 - Print Quality Intent: How to best express it in job ticket?
 - Bounding Volume/Location: How to specify, how to report?
 - Require TLS support and use?



Print Quality Intent

- IPP currently has some existing attributes:
 - print-quality (type2 enum): Simple numeric quality levels: 'draft', 'normal', and 'high' (best)
 - print-content-optimize (type2 keyword): Simple string describing print quality priority: 'auto', 'graphic', 'photo', 'text', 'text-and-graphic'
 - printer-resolution (resolution): Numeric output resolution
- First pass of 3D extensions defined many attributes specific to FDM printing:
 - Fill percent, shell and layer thickness, print speed
 - Discussions at the last F2F lead us to remove these and re-think how to specify print quality differently



Bounding Volume/Location

- **print-volume (1setOf collection)** - Volume/location to use for printing each object (informative, supplied by Client)
 - document-number (integer(1:MAX)) - OPTIONAL document number
 - object-uuid (uri) - OPTIONAL UUID of object
 - x-offset (integer(0:MAX)) - X offset from left in millimeters
 - y-offset (integer(0:MAX)) - Y offset from front in millimeters
 - x-dimension (integer(0:MAX)) - X length in millimeters
 - y-dimension (integer(0:MAX)) - Y length in millimeters
 - z-dimension (integer(0:MAX)) - Z length in millimeters
 - No "z-offset" since we assume the object is printed flush to the build platform...
- **print-volume-actual (1setOf collection)** - Volume and location of printed objects (authoritative, generated by Printer)



Print Quality Intent (con't)

- Second pass of 3D extensions defines a single additional attribute:
 - print-quality-details (1setOf type2 keyword): List of strings describing desired output characteristics such as 'accuracy' for dimensional accuracy, 'material' for minimizing material usage, 'opacity' for maximizing the opacity of the print, 'speed' for maximum print speed.
- Feedback on the "print-quality-details" attribute so far:
 - May be hard to implement - how to map to slicer parameters, some things are more design (object) details and not something that the printer could automatically for the current state of the art, etc.
 - 'strength' (one of the proposed keywords) is really specifying an optimization of the strength-to-weight ratio
 - Need to review all keywords (naming and definitions)
 - How will this look in the Client UI?
 - What if the Client specifies all of the supported values?



Print Quality Intent (con't)

- Is the "print-quality-details" approach viable?
- What kinds of things do we want to specify for print quality intent?



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Lunch Break



IPP Finishings 2.1

- Current draft (interim draft):
 - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippfinishings21-20160411-rev.pdf>
- Issues to discuss:
 - How to handle finishings that are specific to media orientation/media path?
 - Angles: clockwise or counter-clockwise?
- Proposed schedule:
 - Prototype draft (content complete) Q3 2016

Proposals



- Media sizes
- Multi-hole punch
- Job account password

Media Sizes



- HP Inc. proposes the following new "media" size names:
 - om_16K_195x270_mm
 - om_16K_184x260_mm



Multi-Hole Punch

- The following are IPP finishings enum values defined for punch
 - Position and number of punches up to four: `punch-dual-left`, ..., `punch-triple-left`, ..., `punch-quad-bottom`
- Issue
 - Lacking definition for multiple hole punching., e.g., 30 rings, 26 rings, etc.
- Proposal
 - Instead of defining all possible number of punches, we request to add these `multi-hole` finishings enum values.
 - `punch-multi-hole-left`, `punch-multi-hole-top`, `punch-multi-hole-right`, `punch-multi-hole-bottom`
 - In addition, define `punching-number` attribute (integer) as a member of "finishings-col/punching".
 - When a client specifies `punch-multi-hole-XX` in a finishing-template, the client, at the same time, needs to specify the number of punch holes as "punching-number" (for example, "26").



Job Account Password

- Issue

- The following are defined in PWG 5100.3 as attributes to associate print jobs with department account ID: job-account-id, job-account-id-default, job-account-id-supported
- However, account-id itself is not confidential information. Therefore, any user who knows the account-id of other departments can print out documents by specifying those account ids.

- Proposal

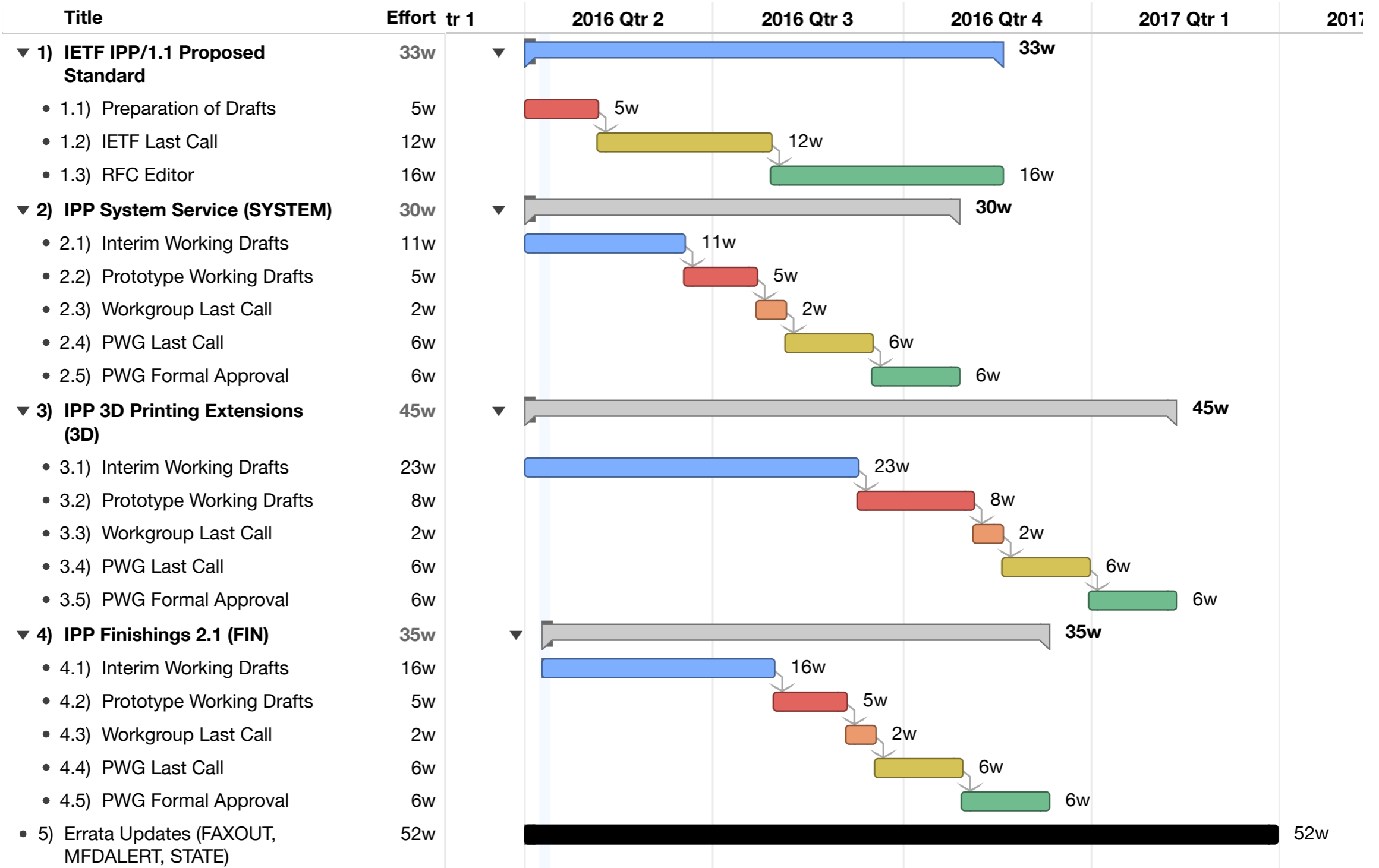
- For security enhancement, define attributes to specify a password for using account-id.
 - job-account-password
 - job-account-password-supported (boolean)
 - job-account-password-repertoire-supported (1setOf (type2 keyword))
- For printers with "job-account-password-supported" set to true, allow clients to set a password for their job-account-id to print out documents. Note that it is implementation dependent as to how the printer is configured with account IDs and account passwords.



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Next Steps

Next Steps





Next Steps

- Advance IPP/1.1 to IETF Proposed Standard
 - IETF Last Call in Q2/Q3 2016
 - IETF process to advance to Internet Standard once published...
- IPP System Service
 - Prototype working draft in Q2/Q3 2016
- IPP 3D Printing Extensions
 - Prototype working draft in Q3 2016
- IPP Finishings 2.1
 - Prototype working draft in Q3 2016
- IPP Transform Service v1.0?
- Other errata (IPP State, etc.)?



More Information

- We welcome participation from all interested parties
- IPP Working Group web page
 - <http://www.pwg.org/ipp/index.html>
- Subscribe to the IPP mailing list
 - <https://www.pwg.org/mailman/listinfo/ipp>
- IPP WG holds weekly phone conferences announced on the IPP mailing list
 - Next conference calls May 9, 2016 at 3pm ET and May 16, 2016 at 4pm ET to discuss 3D Printing