



# The Printer Working Group

IPP Workgroup Session, Day 1

February 10, 2016

PWG F2F Meeting

Sunnyvale, CA (Apple)



## February 10, 2016

When	What
1:00 - 1:15	IPP Workgroup Status
1:15 - 1:45	IETF IPP/1.1 Updates
1:45 - 4:00	IPP System Service

## February 11, 2016

When	What
9:00 - 12:00	IPP 3D Printing Extensions
12:00 - 1:00	Lunch
1:00 - 1:30	IPP Job Password Repertoire
1:30 - 2:00	Plethora of Proposals
2:00 - 2:30	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 Job Password Repertoire



- 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 Everywhere Printer Self-Certification Manual 1.0 (SELFCERT)
    - Stable, PWG Formal Vote
  - IPP System Service (SYSTEM)
    - Interim Draft
  - IPP 3D Printing Extensions (3D)
    - Interim Draft
- PWG White Papers in development:
  - IPP Job Password Repertoire
    - Interim Draft

# Status (2/2)



- Recent Full Standard:
  - PWG 5100.12-2015: IPP 2.0, 2.1, and 2.2
- Recent Candidate Standards:
  - 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-Certification (SELFCERT)



- Current stable draft, tools, and web site content:
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeveselfcert10-20151110.pdf>
  - <http://www.pwg.org/ipp/everywhere.html> (for tools)
  - <http://beta.pwg.org/ippeveselfcert> (submission form)
  - <http://beta.pwg.org/printers> (printer list)
- Github repository for tools:
  - <https://github.com/istopwg/ippeveselfcert>
- PWG Formal Vote until February 19, 2016

# 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 - Q1/Q2 2016
  - IESG Approval - Q2/Q3 2016





# IPP System Service (SYSTEM)

- Current interim draft at:
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippssystem10-20160117-rev.pdf>
- Proposed Schedule:
  - Prototype draft in Q2 2016



# The Printer Working Group

IPP Workgroup Session, Day 2

February 11, 2016

PWG F2F Meeting

Sunnyvale, CA (Apple)

# Agenda



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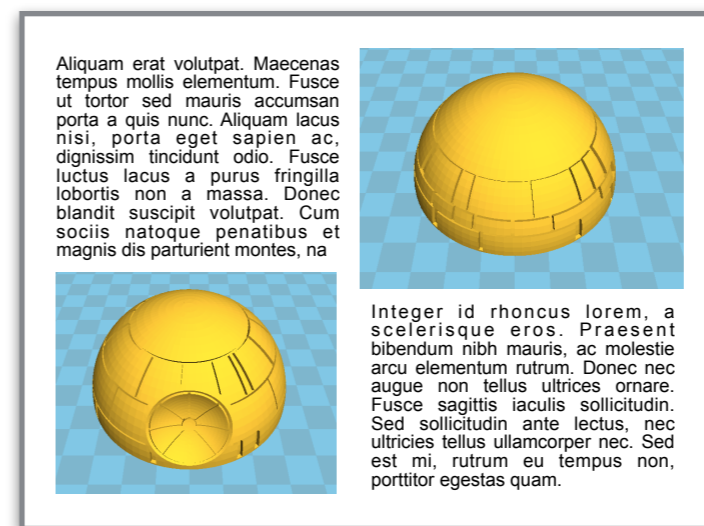
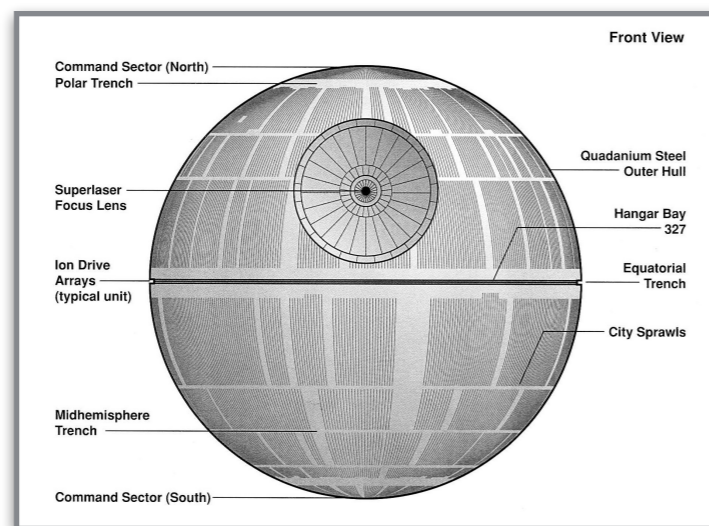


# IPP 3D Printing Extensions

- Current draft (interim):
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipp3d10-20160201-rev.pdf>
- Proposed schedule:
  - Prototype draft (content complete) Q3 2016
- Items for discussion:
  - Do we want to require or recommend any document formats for 3D printing over IPP? Or simply talk about how to support different formats with implementation guidance?
  - PDF 2.0 and PDF/E add 3D content to PDF files (next slide)
  - IEEE work on 3D Printing (following slides)
  - Collaborating with other standards bodies and industry groups

# PDF 2.0 and PDF/E

- How do we choose/identify content for printing (multiple U3D objects in file, potentially multiple objects per page or one object shared across multiple pages with different views)



- How do we map materials between Job Ticket and PDF file?
  - PDF U3D content has named materials, same as AMF and 3MF...



# IEEE Projects Concerning 3D Printing

- IEEE P3030 - Standard for Consumer 3D Printing: Overview and Architecture
  - <http://standards.ieee.org/develop/project/3030.html>
  - *"This standard defines an architectural framework for consumer 3D printing, including descriptions of various domains (systems, services, devices, participants, etc.), definitions of domain abstractions, and identification of commonalities between different domains. The architectural framework for consumer 3D printing provides a reference model that defines relationships among various domains and common architecture elements. It also provides a blueprint for data abstraction, quality, protection and safety."*
  - Project approved in March 2015, expires end of 2019
  - Have not gotten a response from the working group chair

# IEEE Projects Concerning 3D Printing (con't)



- IEEE P3333.2.5 - Bio-CAD File Format for Medical Three-Dimensional (3D) Printing
  - <https://standards.ieee.org/develop/project/3333.2.5.html>
  - *"To establish the standardization of accurate and optimized Bio-CAD file format system for medical 3D Printing. This standard defines the Bio-CAD format for three-dimensional (3D) Printing based on Sectional Scan image data containing surface and volumetric information. Standardization is related to medical 3D printing services, including anatomic, pathologic models and medical instrument printing based on two-dimensional images, three-dimensional medical data and other medical data."*
  - Project approved in August 2015, expires end of 2019
  - Probably not something a printer would support directly since it will require selection of features to print and other human interaction prior to printing



# The Printer Working Group

Lunch Break





# IPP Job Password Repertoire

- Current draft (white paper):
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wp-job-password-repertoire-20160101.pdf>
- Next steps:
  - Approve attribute and value registrations Q1 2016



# Plethora of Proposals

- Status Values for Input Trays
- New Media Names
- New "trimming-type" Keyword Value
- "Eco" Stapling
- "Engineering Z" Fold
- Media Orientation and Finishing Templates
- Punch Characteristics (Origin, Shape, Size)
- Staple Characteristics (Origin, Angle, Size)
- Implementation of "finishings-col-database"
- IPP Finishings 2.0 Errata



# Status Values for Input Trays

- Questions from many vendors on what the “printer-input-tray” status values should be for various ‘media-xxx’ “printer-state-reasons” values
  - This value comes from the Printer MIB prtInputStatus property, which is a PrtSubUnitStatusTC value
  - Section 2.2.13.2.2 of RFC 3805 defines the values
  - Appendix E references a PDF with values for different statuses (but not an exhaustive list):
    - <http://ftp.pwg.org/pub/pwg/pmp/contributions/Top25Errors.pdf>
  - ‘media-empty’ maps to status 19 (Unavailable because broken + Critical Alerts =  $3+16 = 19$ )
  - ‘media-low’ maps to status 8 (Non-Critical Alerts)
  - ‘media-needed’ isn’t list, but could be status 17 (Unavailable and OnRequest + Critical Alerts =  $1+16 = 17$ ) or status 49 (Unavailable and OnRequest + Critical Alerts + State if Off-Line =  $1+16+32 = 49$ )

# New Media Names

- Canon has requested registration of new media size names for common and/or standard sizes used with large format printers:
  - A2+ (17x24in) - 'oe\_a2plus\_17x24in'
  - Arch E2 (26x38in) - 'oe\_arch-e2\_26x38in'
  - Arch E3 (27x39in) - 'oe\_arch-e3\_27x39in'
  - 10R (10x12in) - 'oe\_photo-10r\_10x12in' (ISO 1008)
  - S10R (10x15in) - 'oe\_photo-s10r\_10x15in' (ISO 1008)
  - 20R (20x24in) - 'oe\_photo-20r-20x24in' (ISO 1008)
  - 12x16" - 'oe\_12x16\_12x16in' (JIS K 7523)
  - 14x17" - 'oe\_14x17\_14x17in' (JIS K 7523)
  - 18x22" - 'oe\_18x22\_18x22in' (JIS K 7523)
- These can just be plain registrations of new "media" keyword values with IPP workgroup approval

# New "trimming-type" Keyword Value

- Canon has requested the registration of a new "trimming-type" keyword value, e.g., 'draw-line', that instructs the printer to draw a line where the media should be cut.
- Many vendors already support this feature through their printer drivers - important for feature parity with drivers.
- It is necessary especially when printing on specific print media, e.g., Flame-Resistant Cloth, which cannot be cut by the built-in paper cutter.
- JDF doesn't address cut lines specifically, but does have cut marks.



# "Eco" Stapling

- Canon has requested support for "eco" stapling which binds paper together without using metal staples.
- Used in more and more offices as an eco-friendly and resource saving alternative to using conventional staples.
- More vendors are supporting both conventional stapler and eco-stapler with their products.
- We would like to request addition of eco-staple definitions.





# "Eco" Stapling (con't)

- **Canon Proposal:**

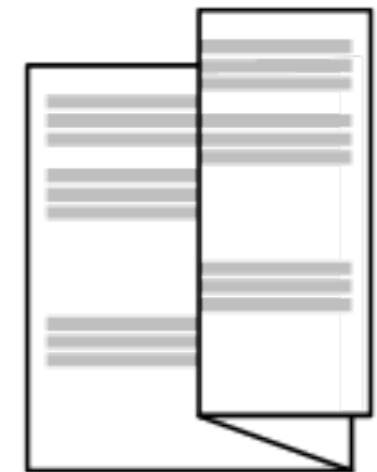
- Add definition of eco-staple in "finishings" Job Template attribute:

eco-staple-top-left  
eco-staple-bottom-left  
eco-staple-dual-top  
eco-staple-dual-left

eco-staple-top-right  
eco-staple-bottom-right  
eco-staple-dual-bottom  
eco-staple-dual-right

# "Engineering Z" Fold

- Xerox has requested explicit support for a variation of the 'fold-z' finishing template:
  - Fold the paper in half vertically, then fold half of that (the side with the non-binding edge) in half vertically again, resulting in the z or half z fold.
- This fold is used to fold something like Tabloid (11x17) or A3 in half, to be the same size as Letter (8.5x11) or A4, and then folding the non-binding side in half again towards the midline. This can then be part of a bound (staple or punch) set, giving you a pull-out 11x17 or A3 sheet in the middle of your bound document.
- Corresponds to JDF's "F8-2" in the fold catalog.





# Media Orientation and Finishing Templates



- HP has reported there is no way to differentiate between "finishing-template" values that vary based on media orientation ("orientation-requested")
  - Both "finishings-col-database" and "finishing-col-ready" allow specification of "media-size" or "media-size-name" member attributes describing the finishing values used for a given media size
- "finishings-col-database/ready (1setOf collection)":
  - Add "orientation-requested (type2 enum)" for different "finishings-template" values based on orientation
- Example: 'punch' template defaults to 3-hole punch in portrait and 2-hole punch in landscape



# Origin, Shape, and Size of Punch Holes

- HP has reported that the origin, shape, and size of punch holes is not defined in IPP Finishings 2.0
- JDF (naturally) has Job Ticket elements for most of these things
  - Punching (HoleMaking): Center, CenterReference, Extent, HoleType, Shape
- We don't want to make IPP finishings as complicated as JDF
  - Hole making capabilities are typically limited to the installed finisher and/or supplies
  - Focus on providing information to the Client for preview

# Origin, Shape, and Size of Punch Holes (con't)



- Specify the origin of the holes as the center of each hole (matches JDF @HoleMakingParams/Center definition)
- Specify that holes are round (JDF @HoleMakingParams/Shape=Round)
  - Q: Are there any IPP printers or finishers that punch anything other than round holes?
- Define an attribute that specifies the diameter of the installed hole punch (JDF @HoleMakingParams/Extent for /Shape=Round holes):
  - "punch-diameter-configured (integer(0:MAX))" Printer Description attribute
  - Specifies punch diameter in PWG units (hundredths of millimeters)



# Origin, Angle, and Size of Staples

- HP has reported that the origin, angle, and size of staples (stitches) is not defined in IPP Finishings 2.0
- JDF (naturally) has Job Ticket elements for most of these things
  - Stitching: StapleShape, StitchWidth, WireBrand, WireGauge
- We don't want to make IPP finishings as complicated as JDF
  - Staple making capabilities are typically limited to the installed finisher and/or supplies
  - Focus on providing information to the Client for preview

# Origin, Angle, and Size of Staples (con't)

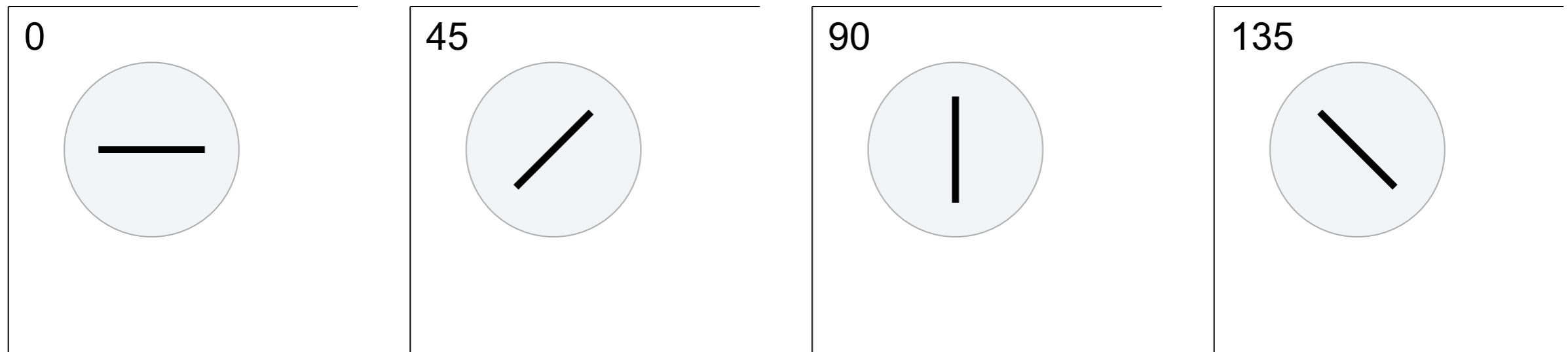


- Specify the origin of the staples as the center of each staple (matches JDF @StitchingParams/StitchPositions definition)
- Specify that the staple shape is implementation-defined with the staple width representing the exposed portion of the staple on the front side of the Impression (matches JDF definition)
- Define an attribute that specifies the width of the installed/configured staples (matches JDF @StitchingParams/StitchWidth):
  - "stitch-size-configured (integer(0:MAX))" Printer Description attribute:
  - Specifies stitch (staple) width in PWG units (hundredths of millimeters)

# Origin, Angle, and Size of Staples (con't)



- Define an attribute that specifies the angle of the staples when applied (matches JDF @StitchingParams/Angle):
  - "stitch-angle-configured (integer(0:179))" Printer Description attribute
  - Specifies stitch (staple) orientation in degrees counter-clockwise from right edge (same as JDF and PostScript):



- Only for corner stitches - edge and saddle stitch are assumed to be parallel to the binding edge

# Implementation of "finishings-col-database"



- HP has reported that the "finishings-col-database" attribute can be very large, just like "media-col-database"
- Should we recommend against including "finishings-col-database" in a Get-Printer-Attributes response unless it is listed in the "requested-attributes" operation attribute?
  - Can't make it a MUST like "media-col-database" since IPP Finishings 2.0 was already published
  - Could say:

Printers SHOULD NOT return this attribute unless it is provided in the "requested-attributes" operation attribute and Clients SHOULD provide the "requested-attributes" operation attribute with the 'finishings-col-database' keyword when needed.



# IPP Finishings 2.0 Errata

- PWG 5100.1-2015: IPP Finishings 2.0
  - <http://ftp.pwg.org/pub/pwg/candidates/cs-ippfinishings20-20141219-5100.1.pdf>
- Lots of proposed finishings additions/changes/clarifications
- Do we publish them as an errata to IPP Finishings 2.0?
  - Develop "IPP Finishings 2.1" draft
  - PWG Last Call and PWG Call for Objections process

*or*

- Do we simply register the new attributes/values and ignore the other issues in IPP Finishings 2.0?
  - Post registration template to IPP WG list
  - Approve in IPP WG meeting



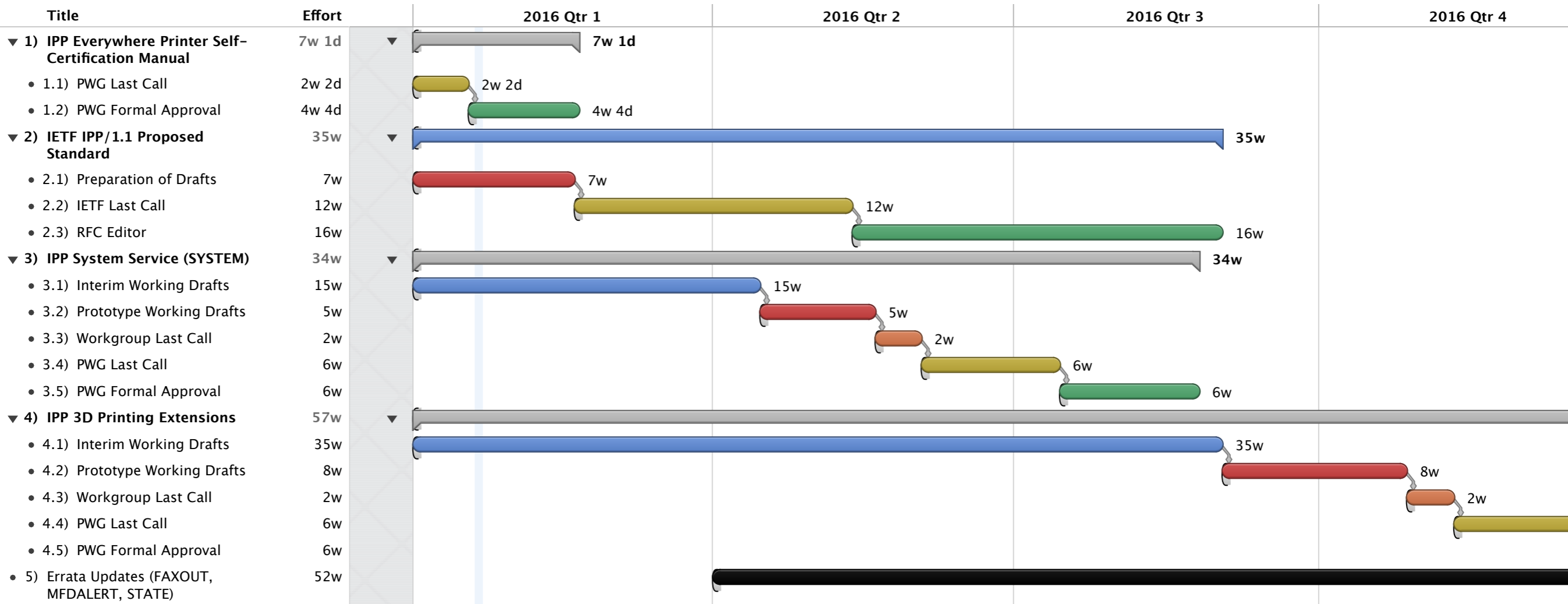


# The Printer Working Group

## Next Steps



# Next Steps





# Next Steps

- IPP Everywhere Printer Self-Certification Manual 1.0
  - PWG Formal Vote concludes on February 19, 2016
- Advance IPP/1.1 to IETF Proposed Standard
  - IETF Last Call in Q1 2016
  - IETF process to advance to Internet Standard once published...
- IPP System Service
  - Prototype working draft in Q2 2016
- IPP 3D Printing Extensions
  - Prototype working draft in Q3 2016
- IPP Finishings 2.0 Errata?
- 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 February 22, 2016 at 4pm ET to discuss 3D Printing and February 29, 2016 at 3pm ET for IPP System Service