



# The Printer Working Group

IPP Workgroup Session, Day 1

November 14, 2016

PWG Virtual F2F Meeting

# 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](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
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## November 14, 2016

When	What
1:30 - 3:00	IPP Workgroup Status, IPP/1.1 Updates, IPP Finishings 2.1
3:00 - 3:15	Break
3:15 - 5:00	IPP Everywhere Printer Self-Certification, IPP 3D Printing Extensions

## November 15, 2016

When	What
1:00 - 4:00	IPP System Service, 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



- IETF RFCs in development:
  - IETF IPP/1.1: Encoding and Transport (obsoletes RFC 2910/3382)
    - IESG Approved,  
RFC Editor's queue
  - IETF IPP/1.1: Model and Semantics (obsoletes RFC 2911/3381/3382)
    - IESG Approved,  
RFC Editor's queue
- PWG Specifications in development:
  - IPP 3D Printing Extensions (3D) - Prototype Draft
  - IPP System Service (SYSTEM) - Interim Draft
  - IPP Finishings 2.1 (FIN) - Stable Draft, WG Last Call

# 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>
    - 19 printers currently listed
- 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>
  - *Both are approved and awaiting publication*
  - *RFCs will eventually be advanced to IETF Internet Standard through status change (IETF process)*
- Proposed schedule:
  - RFC Publication - Q4 2016

# IPP Finishings 2.1



- Current stable draft:
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippfinishings21-20161109-rev.pdf>
- Do a PWG Call for Objections or PWG Formal Vote?
  - Some new attributes/member attributes (new technical content):
    - "media-sheets-supported" member attribute for "finishings-col-database" and "finishings-col-ready"
    - "stitching-method" member attribute for "stitching" member attribute of "finishings-col"
    - "printer-finisher-supplies" and "printer-finisher-supplies-description" attributes.
  - Formal vote will require a PWG Last Call first, delaying approval until 2017
  - Consensus among four attendees at November 2, 2016 conference call was to do a PWG Last Call and Formal Vote



# The Printer Working Group

Break



# IPP Everywhere Self-Certification

- PWG 5100.20-2016: IPP Everywhere Printer Self-Certification Manual (SELFCERT)
  - <http://ftp.pwg.org/pub/pwg/candidates/cs-ippeveselfcert10-20160219-5100.20.pdf>
- Released v1.0 Update 1 of self-certification tools on October 28th, 2016
- Resources:
  - <http://www.pwg.org/ipp/everywhere.html> (for tools)
  - <https://www.pwg.org/ippeveselfcert> (submission form)
  - <http://www.pwg.org/printers> (printer list)
- Github repository for tools:
  - <https://github.com/istopwg/ippeveselfcert>
- Proposed Schedule:
  - 1.1 errata update: Q1/Q2 2016



# IPP Everywhere Self-Certification

- 1.0 Update 1 changes:
  - Issue #3: Fix handling of service instance names starting with "\_".
  - PR #5: Add date to log files.
  - Issue #6: Do exact matches of service instance names.
  - Issue #7: Do not require a resource path of "/ipp/print".
  - Issue #9: Do not require "document-numbers" member attribute.
  - Issue #13: Allow 'unknown' values for "date-time-at-xxx" attributes.
- Future 1.1 errata update for manual and tools in 2017:
  - More tests (Cancel-My-Jobs, Close-Job, Identify-Printer)
  - Other necessary changes that are not simple bug fixes in the tools/submission portal
  - Proposed schedule:
    - Interim working draft in Q1 2017



# IPP 3D Printing Extensions

- Current draft (prototype):
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipp3d10-20160824-rev.pdf>
- Proposed schedule:
  - Stable draft next week
  - PWG Last Call Q4 2016
- Prototype experience (next slide)



# Prototype Experience (Apple)

- Apple has implemented all of the required parts of the IPP 3D Printing Extensions - the current prototype is available at:
  - <https://github.com/istopwg/ippsample>
  - The "examples" directory contains sample 3MF files from the 3MF Consortium's Github samples repository, along with an ipptool test file (create-job-3d.test) that can be used to test a prototype.
- One additional issue found during prototyping:
  - No way to tell Client that the Printer can reproduce multiple colors (not just the material color)
    - Proposal: Add "color-supported (boolean)" Printer Description attribute (standard attribute for 2D printing)



# The Printer Working Group

IPP Workgroup Session, Day 2

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# Agenda



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## November 15, 2016

When	What
1:00 - 4:00	IPP System Service, Next Steps



# IPP System Service (SYSTEM)

- Current interim draft at:
  - <http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippssystem10-20161101-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
- In addition to making the System service responsible for resource management, this specification simplifies the data model, semantics, and life cycle of Resource objects (next slides)
- Proposed Schedule:
  - Prototype draft in Q4 2016/Q1 2017



# IPP Resource Object Model

- Resource objects are managed by the System service
  - Only administrators can create, install, and cancel Resources
  - Simple state model and life cycle (later slide)
  - Resources include fonts, forms/templates, icons, logos, ICC profiles, firmware, and applications
  - Resources have a unique integer ID: "resource-id (integer(1:MAX))"
- Resources can be allocated to Jobs and Printers
  - Job Resources are allocated with the Create-Job/Print-Job/Print-URI operations and the "resource-ids (1setOf integer(1:MAX))" operation attribute
  - Job Resources are deallocated when the Job reaches a terminating state
  - Printer Resources are allocated with the Create-Printer or Allocate-Printer-Resources operations and the "resource-ids (1setOf integer(1:MAX))" operation attribute
  - Printer Resources are deallocated with the Deallocate-Printer-Resources operation (Q: or Cancel-Resource???)

# IPP Resource Description Attributes (Read-Write)



- "resource-info (text(127))"
- "resource-name (name(127))"
- "resource-owner-col (collection)"
  - "owner-uri (uri)"
  - "owner-vcard (1setOf text(1023))"

# IPP Resource Status Attributes (Read-Only)



- "date-time-at-canceled (dateTime | unknown | no-value)"
- "date-time-at-creation (dateTime | unknown)"
- "date-time-at-installed (dateTime | unknown | no-value)"
- "resource-data-uri (uri | no-value)"
- "resource-format (mimeType)"
- "resource-id (integer(1:MAX))"
- "resource-k-octets (integer(0:MAX))"
- "resource-state (type1 enum)"
  - 'pending', 'available', 'installed', 'canceled', 'aborted'
- "resource-state-message (text(MAX))"
- "resource-state-reasons (1setOf type2 keyword)"
  - 'cancel-requested', 'install-requested', 'resource-incoming'
- "resource-string-version (text(127))"

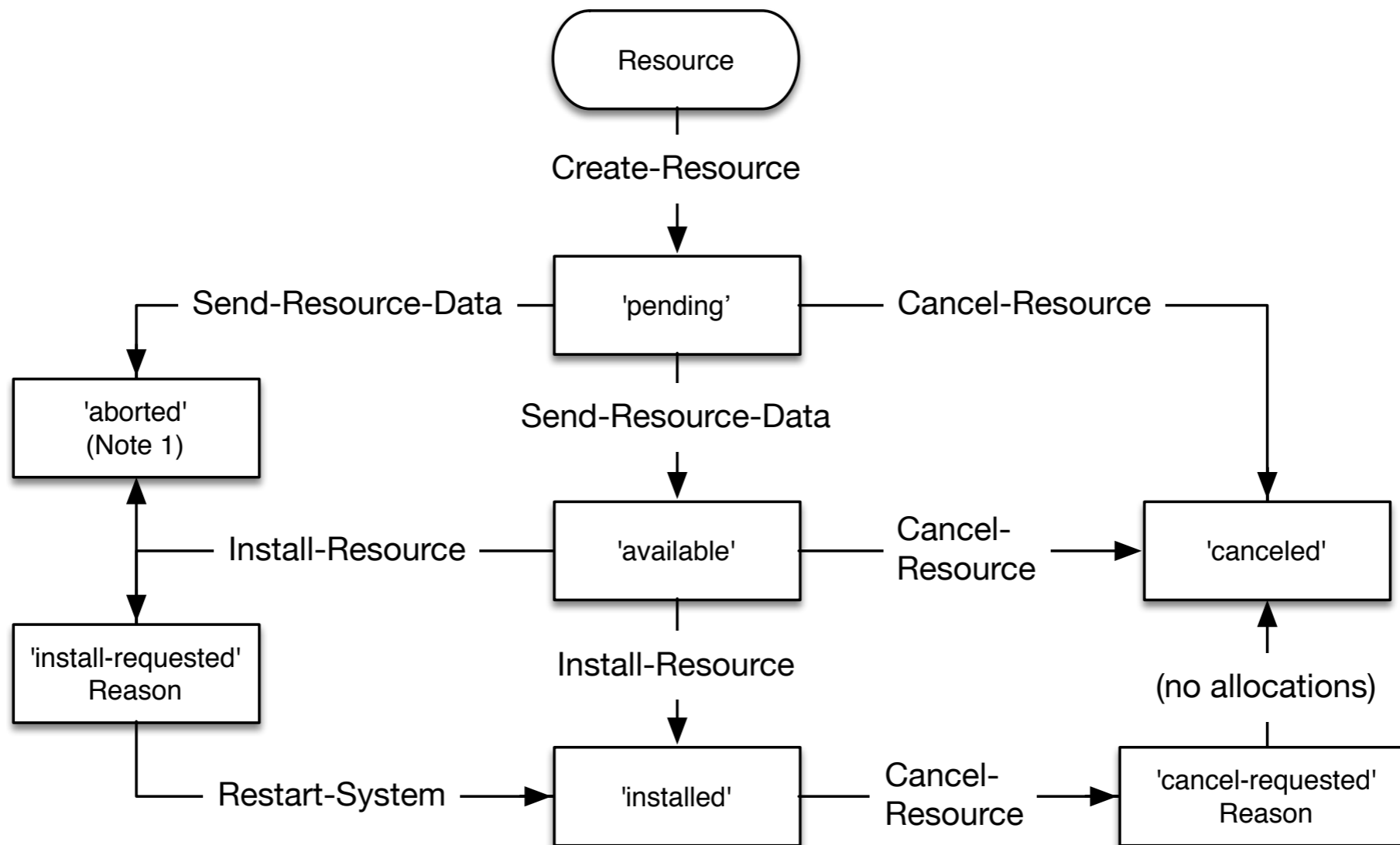
# IPP Resource Status Attributes (con't)

## (Read-Only)



- "resource-type (type2 keyword)"
  - 'executable-firmware', 'executable-software', 'static-font', 'static-form', 'static-icc-profile', 'static-image', 'static-logo', 'template-document', 'template-job', 'template-printer'
- "resource-uuid (uri)"
- "resource-version (octetString(16))"
- "time-at-canceled (integer(MIN:MAX) | no-value)"
- "time-at-creation (integer(MIN:MAX))"
- "time-at-installed (integer(MIN:MAX) | no-value)"
- Question: Do we want to expose the resource allocation count, e.g., "resource-use-count (integer(0:MAX))"?
  - Implementations already need to track this
  - Cancel-Resource is delayed when a resource is allocated to a Job, Printer, or System (running firmware)

# IPP Resource Life Cycle



Note 1: A Resource object can transition to the 'aborted' state due to an interrupted Send-Resource-Data request, corrupted Resource data, an unsupported Resource data format, inability to store the Resource data, and/or inability to install the Resource data. The "resource-state-reasons" attribute will contain the reason for the Resource being aborted.

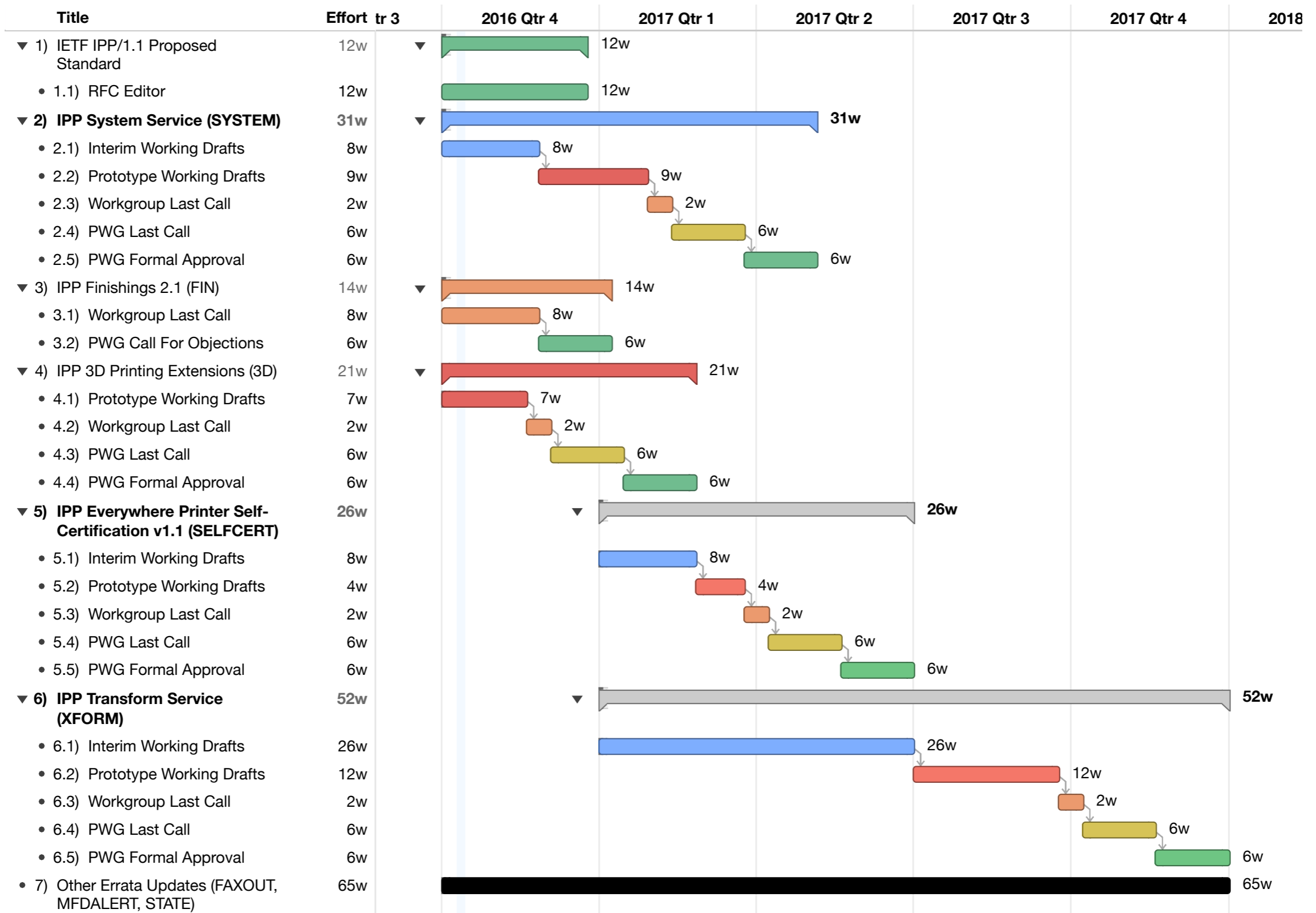




# The Printer Working Group

## Next Steps

# Next Steps





# Next Steps

- Advance IPP/1.1 to IETF Internet Standard
  - IETF process to advance to Internet Standard once RFCs are published...
- IPP System Service
  - Prototype working draft in Q4 2016/Q1 2017
- IPP 3D Printing Extensions
  - PWG Last Call in Q4 2016
- IPP Finishings 2.1
  - PWG Call for Objections in Q4 2016
- IPP Everywhere Printer Self-Certification Manual v1.1
  - Interim working draft in Q1 2017
- IPP Transform Service v1.0
  - Initial working draft in Q1 2017
- Other errata (IPP State, etc.) in 2017
  - Specific documents for 2017?
  - Volunteers?



# 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 November 30, 2016 and December 14, 2016 at 1pm ET