



The Printer Working Group

PWG August 2019 Face-to-Face
Plenary Session

Smith Kennedy, PWG Chair
August 28, 2019

Plenary Agenda



- Administrivia
- PWG Steering Committee Updates
- PWG Workgroup Status [WG Chairs]
- Liaison Status
- Questions / Next Meeting / Any Other Business

Administrivia



- Welcome and Introductions
- Confirm Minutes Taker
- Review PWG Patent Policy
- Agenda

PWG IP Policy



- "This meeting is being held in accordance with the PWG Intellectual Property Policy"
 - https://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)



PWG Patent Statement

PWG standards may include the known use of essential patents and patent applications provided the PWG Chair receives assurance from the patent holder or applicant with respect to patents whose infringement is, or in the case of patent applications, potential future infringement the applicant asserts will be, unavoidable in a compliant implementation of either mandatory or optional portions of the standard. This assurance shall be provided without coercion.

PWG Patent Statement



This assurance shall be either:

- A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement either mandatory or optional portions of the proposed PWG standard against any person or entity complying with the standard; or
- A statement that a license for such implementation will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination.



PWG Patent Statement

The PWG is not in a position to give authoritative or comprehensive information about evidence, validity or scope of patents or similar rights, but it is desirable that any available information should be disclosed. Therefore, all PWG members shall, from the outset, draw PWG's attention to any relevant patents either their own or of other organizations including their Affiliates that are known to the PWG members or any of their Affiliates, although PWG is unable to verify the validity of any such information.

Inappropriate Topics for PWG Working Group Meetings



Do Not Discuss:

- The validity/essentiality of patents/patent claims
- The cost of specific patent use
- Licensing terms or conditions
- Product pricing, territorial restrictions, or market share
- Don't discuss ongoing litigation or threatened litigation

DO raise an objection if inappropriate topics are discussed



Agenda Overview – Day 1

(All times Mountain Standard Time)

Wednesday, August 28

- 9:00 – 10:15 PWG Plenary
- 10:15 – 10:30 IPP WG : Status
- 10:30 – 11:00 IPP WG : IPP Everywhere™
- 11:00 – 11:30 Break / Lunch
- 11:30 – 1:30 IPP WG: IPP Job and Printer Extensions – Set 3 (JPS3) v2.0
- 1:30 – 1:45 Break
- 1:45 – 3:00 IPP WG: IPP Production Printing Extensions v2.0



Agenda Overview – Day 2

(All times Mountain Standard Time)

Thursday, August 29

- 9:00 – 11:00 IDS WG: Status and Discussion
- 11:00 – 11:30 Break / Lunch
- 11:30 – 12:30 IPP WG: IPP Encrypted Jobs and Documents v1.0
- 12:30 – 1:30 IPP WG: IPP System Service v1.0
- 1:30 – 1:45 Break
- 1:45 – 3:00 IPP WG: IPP Enterprise Printing Extensions v2.0 ·
Job Accounting With IPP v1.0



Agenda Overview – Day 3

(All times Mountain Standard Time)

Friday, August 30

- 9:00 – 10:00 IPP WG: Errata Review
- 10:00 – 11:00 IPP WG: 3D Printing Liaisons Status and Topics
- 11:00 – 11:30 Break / Lunch
- 11:30 – 1:00 IPP WG: 3D Printing Metadata BoF · 3D PDF
- 1:00 – 1:15 IPP WG: Next Steps



The Printer Working Group

Steering Committee Updates



Officers (2017-2019 Term)

- PWG Chair: Smith Kennedy, HP Inc.
- PWG Vice-Chair: Alan Sukert, Xerox
- PWG Secretary: Ira McDonald, High North

2019 is a PWG Officers election year. Selection of officers begins in Fall 2019.

Those interested in serving in a PWG Officer role should contact chair@pwg.org.

2019 Membership



25 Members

 Apple Inc.	 Fuji Xerox	 Konica Minolta	 MPI Tech	Technical Interface Consulting
 Brother Industries, Ltd.	 Google	 Kyocera Document Solutions Inc.	 Oki Data	 Toshiba America Business Solutions
 Canon	 High North, Inc.	 Lexmark	 Qualcomm	 Tykodi Consulting Services LLC
Danny Brennan	 HP Inc.	 Meteor Network	 Ricoh	 Xerox
 Epson	 Intel	 Microsoft	 Synaptics	YSoft



Future Meeting Schedule

- 2019
 - November 13-14 : Virtual
- 2020
 - February 4-5: Virtual?
 - May 5-7: Location TBD Sunnyvale? Lexington? San Diego? Tahiti?
 - August 26-27: Virtual?
 - November 11-12: Virtual

Contact chair@pwg.org if you are interested in hosting a PWG F2F event



IPP Everywhere™ Certified Printers

- <https://www.pwg.org/ipp/everywhere.html>
- IPP Everywhere™ Self Certification 1.0 Update 3
 - Current certification toolset available on PWG website
 - Released November 2018
- ~~385~~ 412 printers now certified!
 - <https://www.pwg.org/dynamo/eveprinters.php>
 - More on the way!
- More to come
 - IPP Everywhere™ v1.1 – PWG LC Q3 2019
 - IPP Everywhere™ Self Certification 1.1 – PWG LC Q4 2019



Recently Approved Specifications

- IPP Document Object v1.1 – May 21, 2019
 - <https://ftp.pwg.org/pub/pwg/candidates/cs-ippdocobject11-20190521-5100.5.pdf>
- IPP Authentication Methods v1.0 – August 16, 2019
 - <https://ftp.pwg.org/pub/pwg/informational/bp-ippauth10-20190816-5199.10.pdf>
- IPP Job Extensions v2.0 – August 16, 2019
 - <https://ftp.pwg.org/pub/pwg/candidates/cs-ippjobext20-20190816-5100.7.pdf>



Public Relations Efforts

- Recent press releases
 - June 18: PWG / 3MF Consortium Liaison Agreement Establishment
 - May 22: Printer Working Group (PWG) to Address 3D Printing Standards at MAY 21 RAPID + TCT Additive Manufacturing Event
- Pending press releases
 - Newly approved IPP specifications and Best Practices
 - IPP Authentication Methods v1.0
 - IPP Job Extensions v2.0
 - IPP Document Object v1.1
 - PWG MFD Alerts v1.1
 - Status of IPP Everywhere™ Program
 - Recently approved 3D related PWG specifications and recently established 3D-related liaison relationships
 - IPP 3D Printing Extensions v1.1
 - PWG Safe G-Code Subset for 3D Printing v1.0



Process Updates

- Including Best Practices and Requirements documents in the numbering system
 - Update to "pwg-namespace-policy.txt" in development
- Process v4.0 still a work in progress



- Original notion: Update existing Process 3.0 to merge in subsequently published PWG process documents
 - [pwg-policy-call-for-obj-last-call-formal-vote-draft-2.txt](#) (draft)
 - [ipp-registry-policy.txt](#)
 - [pwg-billing-policy-20141001.txt](#)
 - [pwg-white-policy-20140505.txt](#)
 - [pwg-charter-policy-20140407.txt](#)
 - [pwg-prototype-policy-20121029.txt](#)
 - [pwg-namespace-policy-20160820.txt](#) (new updated draft)
- Revised notion: Refactor the Process document to describe the processes of the PWG to make them simple and obvious to the uninitiated reader:
 - Proposing new work to the PWG
 - Approving new work and assigning to a PWG work group
 - PWG approval for various document types
 - whitepaper
 - standard
 - etc.



Design Principles Whitepaper

- Purpose:
 - A document that describes the PWG's core tenets and design principles that guide the design and creation of its IPP, Semantic Model, MIBs, and other technologies
- Scope / Topics to be Covered:
 - IPP
 - Late binding principle
 - Intent vs. process for Job fidelity
 - Value of separating Job attributes from Document content
 - IPP attribute types and design patterns
 - Printer Status vs. Printer Description
 - xxx / xxx-supported / xxx-default vs. xxx / xxx-configured / xxx-supported
 - Collections vs. textual encoding of MIB sequences ("printer-finisher")
 - Semantic Model
 - Creates comprehensible view of the elements in an Imaging System, allowing better communication with other standards organizations dealing with related matters.
 - Presents the basic features necessary in communicating with imaging services, independent of the protocols used in that communication
 - Allows exploitation of the inherent parallelism between different types of imaging services (Print, Scan, Fax, etc.)



Projects on GitHub

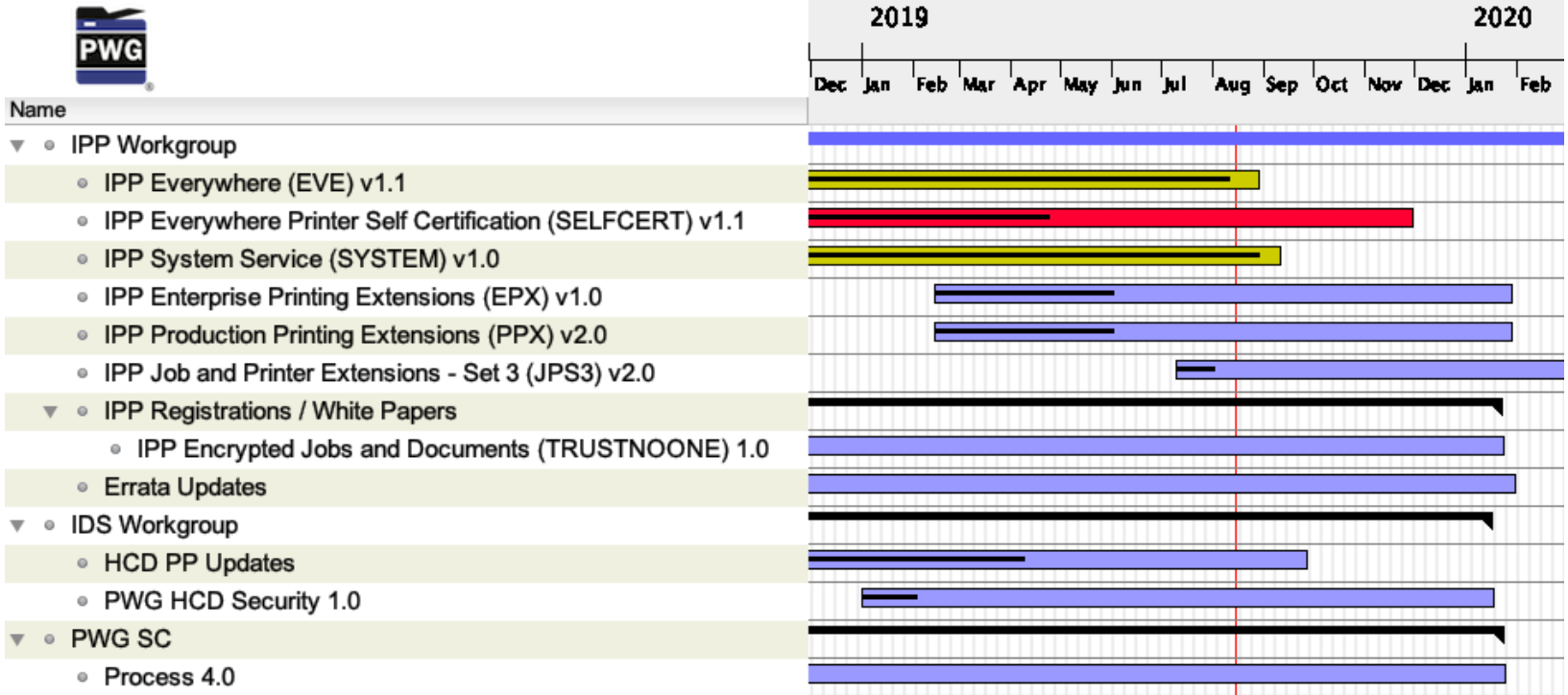
- PWG on GitHub:
 - <https://github.com/istopwg>
- IPP Sample
 - <https://github.com/istopwg/ippsample>
- IPP Everywhere Self Certification Tools
 - <https://github.com/istopwg/ippeveselfcert>
- IPP Registry
 - <https://github.com/istopwg/ippregistry>
- PWG Books:
 - <https://github.com/istopwg/pwg-books>



The Printer Working Group

Workgroup Status

Work In Progress



Planned
Interim
Prototype
Prototyped
Stable



The Printer Working Group

IDS Workgroup Status

Alan Sukert (Xerox)



IDS: Original Charter

- Investigate and define standards for addressing general security attributes for imaging devices and services. Our general goals are to:
 - Define standard metrics and protocol bindings to assess the health of Hardcopy Devices to gauge if they should be granted access to a network.
 - Define a set of standard security and policy attributes and values for authorizing Hard Copy Devices, their services and users in a global workspace
 - Provide a general security model for other PWG standards to reference
- Provide a path for vendors to review and contribute to the definition of Common Criteria HCD Protection Profiles



IDS WG: Officers

- **IDS WG Chair:**
 - Alan Sukert (Xerox)
- **IDS WG Vice-Chair**
 - Brian Smithson (Ricoh)
- **IDS WG Secretary:**
 - Alan Sukert (Xerox)
- **IDS WG Document Editors:**
 - Ira – HCD Security Guide



IDS: Current Status

- IDS Charter updated to reflect development of HCD Security Guide by Ira
- Focus now is on Common Criteria HCD Protection Profiles
 - IDS Charter updated to focus the IDS WG on outreach with other standards bodies involved in HCD security issues.
 - Looking at initiating interface with TCG Joint Work Group and TBD
 - Conference Calls.
 - Reinitiated Regular IDS Conference Calls
 - Calls held on 5/16/19, 6/13/19, 7/11/19, 8/8/19 and 8/22/19.
 - Next Conference Call tentatively scheduled for 9/19/19

IDS: Current Status



- Focus now is on Common Criteria HCD Protection Profiles
 - HCD Technical Committee (TC) Conference Call/Meetings:
 - Regular HCD TC Conference Calls - calls held on 5/13/19, 6/3/19, 7/8/19 and 8/19/19
 - Next HCD TC F2F is Thursday, Sep 26th at the 16th CCUF Workshop in Singapore
 - Results of the April 10th HCD TC F2F, status of the HCD TC, HCD PP Version 1.1, the effort to form an HCD international TC (iTC) and potential contents of an HCD cPP v1.0 were discussed at the IDS WG Face-to-Face Session on Wednesday, Apr 18th
 - Will discuss the results of HCD TC Meetings since the 4/18/19 IDS F2F and HCD iTC status at the IDS F2F Session on Thursday (Aug 29th)
 - Also looking into establishing possible liaison with TCG and with ISO JTC 1/SC 28 to follow additional standards efforts related to the security of image devices



The Printer Working Group

IPP Workgroup Status

Paul Tykodi (TCS), Ira McDonald (High North)



IPP WG: Charter

- 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: Officers

- 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) – IPP Encrypted Jobs and Documents, IPP Everywhere v1.1, IPP Everywhere Printer Self-Certification Manual v1.1, Job Accounting with IPP v1.0, IPP Job Extensions v2.0, IPP System Service v1.0
 - Smith Kennedy (HP Inc.) – IPP Job and Printer Extensions – Set 3 (JPS3) v2.0, IPP Encrypted Jobs and Documents, IPP Enterprise Printing Extensions v1.0 (EPX)



IPP WG: Status (1/2)

- PWG Specifications in development:
 - IPP Encrypted Jobs and Documents v1.0 – Interim
 - IPP Everywhere v1.1 – Stable
 - IPP Everywhere Printer Self-Certification Manual v1.1 – Prototype
 - IPP Enterprise Printing Extensions v1.0 – Interim
 - IPP System Service v1.0 – Stable
- IPP Best Practices in development:
 - Job Accounting with IPP v1.0 – Initial
- Recently published:
 - PWG 5100.7-2019: IPP Job Extensions v2.0
 - PWG 5199.10-2019: IPP Authentication Methods v1.0



IPP WG: Status (2/2)

- Up-to-date pending IANA registrations online:
 - <https://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>
 - 412 printers currently listed
 - Second 1.0 self-certification tools update released in October 2017
 - Third 1.0 self-certification tools update released in November 2018
- IPP Sample Code:
 - Github repository:
 - <https://github.com/istopwg/ippsample>
 - Fork of CUPS code includes ippeveprinter, ippfind, ippproxy, ippserver, ipptool, ipptransform, and ipptransform3d



IPP WG: 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, September 12 and 26, 2019 at 3pm ET



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The Printer Working Group

Liaison Status



Trusted Computing Group (TCG)

- **Next TCG Members Meetings**

- 14-17 October 2019 – Toronto, ON, Canada – Ira to call in
- 10-13 February 2020 – Miami, FL, USA – Ira to call in

- **Trusted Mobility Solutions (TMS)** – Ira is co-chair and co-editor

- Scope: mobile phones, telecom networks, enterprise/financial BYOD
- Formal liaisons – [ATIS](#) (5G Security), ETSI (NFV/MEC), Global Platform (TEE and SE)
- [GP/TCG collaboration – Remote Attestation in IETF RATS WG](#)
- Informal liaisons – 3GPP, ITU-T, GSMA, SAE, IETF TLS, IETF SACM, US NIST
- [TCG TMS Use Cases v2 – published September 2018](#)

- **Mobile Platform (MPWG)** – Ira is co-editor

- Scope: mobile phones, tablets, etc.
- Formal liaisons – [ATIS](#) (5G Security), ETSI (NFV/MEC), Global Platform (TEE and SE),
- [TCG Runtime Integrity Preservation for Mobile Devices – public review in August 2019](#)
- [TCG/GP collaboration – Integrating GP and TCG Security Technologies](#)

- **Recent Specifications**

- <http://www.trustedcomputinggroup.org/resources>
- [TCG Runtime Integrity Preservation for Mobile Devices – public review August 2019](#)
- [TCG Trusted Attestation Protocol \(TAP\) Info Model – publication August 2019](#)
- [TCG Trusted Attestation Protocol \(TAP\) Use Cases – public review August 2019](#)
- [TCG TPM 2.0 Auto Thin Profile – publication August 2019](#)
- [TCG TSS 2.0 Enhanced System Level API \(ESAPI\) – publication August 2019](#)
- [TCG TSS 2.0 System Level API \(SAPI\) – publication August 2019](#)
- [TCG RIV: Network Equipment Remote Attestation – public review June 2019](#)
- TCG Storage: PYRITE – public review in June 2019
- TCG Storage: RUBY – public review in June 2019



Internet Engineering Task Force (IETF) (1 of 3)

- **Next IETF Members Meetings**

- IETF 106 – 16-22 November 2019 – Singapore – Ira to call in
- IETF 107 – 21-27 March 2020 – Vancouver, BC, Canada – Ira to call in

- **Transport Layer Security (TLS)**

- DTLS/1.3 – draft-32 – July 2019 – waiting for interoperability reports
<https://datatracker.ietf.org/doc/draft-ietf-tls-dtls13/>
- **TLS/1.3 – RFC 8446 – August 2018**
<https://tools.ietf.org/html/rfc8446>

- **Security Automation and Continuous Monitoring (SACM)**

- Concise Software Identifiers – draft-12 – July 2019 – WG Last Call
<https://datatracker.ietf.org/doc/draft-ietf-sacm-coswid/>
- SACM Architecture – draft-02 – July 2019
<https://datatracker.ietf.org/doc/draft-ietf-sacm-arch/>
- SACM Endpoint Posture Collection Profile – draft-05 – June 2019 – WG Last Call
<https://datatracker.ietf.org/doc/draft-ietf-sacm-ecp/>

- **Concise Binary Object Representation (CBOR)**

- **Concise Data Definition Language (CDDL) – RFC 8610 – June 2019**
<https://tools.ietf.org/html/rfc8610> - JSON/CBOR schema
- Concise Binary Object Representation (CBOR) – draft-06 – July 2019
<https://datatracker.ietf.org/doc/draft-ietf-cbor-7049bis/>
- CBOR Tags for Typed Arrays – draft-05 – July 2019
<https://datatracker.ietf.org/doc/draft-ietf-cbor-array-tags/>



Internet Engineering Task Force (IETF) (2 of 3)

• **Remote ATtestation ProcedureS (RATS)**

- Entity Attestation Token (EAT) – draft-01 – July 2019
<https://datatracker.ietf.org/doc/draft-ietf-rats-eat/>
- Network Device Attestation Workflow – draft-00 – July 2019
<https://datatracker.ietf.org/doc/draft-fedorkow-rats-network-device-attestation/>
- YANG Module for Basic Challenge-Response-based Remote Attestation Procedures – draft-01 – July 2019
<https://datatracker.ietf.org/doc/draft-birkholz-rats-basic-yang-module/>
- Information Model for Assertions used in RATS – draft-00 – July 2019
<https://datatracker.ietf.org/doc/draft-birkholz-rats-information-model/>
- Use cases for Remote Attestation common encodings – draft-04 – July 2019
<https://datatracker.ietf.org/doc/draft-richardson-rats-usecases/>
- ARM's Platform Security Architecture (PSA) Attestation Token – draft-02 – July 2019
<https://datatracker.ietf.org/doc/draft-tschofenig-rats-psa-token/>
- Reference Interaction Model for Challenge-Response-based Remote Attestation – draft-01 – July 2019
<https://datatracker.ietf.org/doc/draft-birkholz-rats-reference-interaction-model/>
- Architecture and Reference Terminology for RATS – draft-01 – March 2019
<https://datatracker.ietf.org/doc/draft-birkholz-rats-architecture/>
- Time-Based Uni-Directional Attestation – draft-00 – March 2019
<https://datatracker.ietf.org/doc/draft-birkholz-rats-tuda/>



Internet Engineering Task Force (IETF) (2 of 3)

- **IRTF Crypto Forum Research Group (CFRG)** – future algorithms
 - Oblivious Pseudorandom Functions (OPRFs) using Prime-Order Groups – draft-01 – July 2019
<https://datatracker.ietf.org/doc/draft-irtf-cfrg-voprf/>
 - XChaCha: eXtended-nonce ChaCha and AEAD_XChaCha20_Poly1305 – draft-01 – July 2019
<https://datatracker.ietf.org/doc/draft-irtf-cfrg-xchacha/>
 - Hashing to Elliptic Curves – draft-04 – July 2019
<https://datatracker.ietf.org/doc/draft-irtf-cfrg-hash-to-curve/>
 - Randomness Improvements for Security Protocols – draft-06 – July 2019 – fundamental
<https://datatracker.ietf.org/doc/draft-irtf-cfrg-randomness-improvements/>
 - Hybrid Public Key Encryption – draft-00 – July 2019
<https://datatracker.ietf.org/doc/draft-irtf-cfrg-hpke/>
 - Re-keying Mechanisms for Symmetric Keys – draft-17 – May 2019
<https://datatracker.ietf.org/doc/draft-irtf-cfrg-re-keying/>
 - Transition from Classical to Post-Quantum Cryptography – draft-05 – May 2019
<https://datatracker.ietf.org/doc/draft-hoffman-c2pq/>
 - **Leighton-Micali Hash-Based Signatures – RFC 8554 – April 2019**
<https://tools.ietf.org/html/rfc8554>
 - **AES-GCM-SIV: Nonce Misuse-Resistant Authenticated Encryption – RFC 8452 – April 2019**
<https://tools.ietf.org/html/rfc8452>



Linux Foundation OpenPrinting

- Linux Foundation OP Google Summer of Code 2018
 - Lots of good work and contributions to PWG's GitHub projects
 - Close reading of a number of PWG specs revealed additional errata – now in progress for several PWG specs
 - Thanks to Linux OpenPrinting coordinators, mentors, and all the students for your hard work and contributions!
- Linux Foundation OP Google Summer of Code 2019
 - Test scripts for ipptool for IPP System Service
 - Test scripts for ipptool for IPP Errata specs
 - Generic Framework: Printer Application from Legacy Driver
 - Improve the pdftoraster filter
 - Turn scp-dbus-service of system-config-printer into C
- Linux Foundation OP Website Renovation – ongoing
 - Aveek and Till found GSoC 2017/2018 students to do the work
 - Changed from WordPress to Jekyll (used by Mike for years)
 - Driverless Printing page displays the PWG IPP Everywhere™ logo
 - Resume in fall 2019 after GSoC 2019 completion



- Mopria liaison to PWG : Jeremy Reitz (Xerox)
- Mopria Alliance 2018 Overview Presentation
 - <https://ftp.pwg.org/pub/pwg/liaison/mopria/Mopria-Alliance-October-2018.pdf>
- PWG 2018 IPP State of the Union
 - <https://ftp.pwg.org/pub/pwg/general/presentations/PWG-2018-IPP-Overview-20180726.pdf>
- No recent updates

3MF Consortium



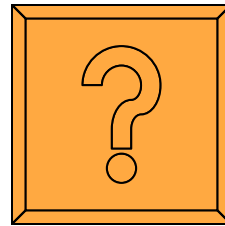
- PWG / 3MF Consortium Liaison signed March 26, 2019
- Joint press release June 18, 2019
 - <https://ftp.pwg.org/pub/pwg/www/press-releases/PWG%203MF%20liaison%20news%20release%20final%20June%2018.pdf>
- No recent updates



3D / Additive Manufacturing Liaisons

- America Makes & ANSI Additive Manufacturing Standardization Collaborative (AMSC) -
 - www.ansi.org/standards_activities/standards_boards_panels/amsc/Default?menuid=3. The IEEE-ISTO Printer Working Group is participating in the AMSC initiative.
- ISO/IEC JTC 1 WG 12 3D Printing and Scanning eCommittee
 - <https://isotc.iso.org/livelink/livelink?func=ll&objId=19905763&objAction=browse&viewType=1> The IEEE-ISTO Printer Working Group is participating in the ISO initiative via the INCITS Ad Hoc.
- Society of Manufacturing Engineers (iRAMP)
 - Interactive Rapid Additive Manufacturing Portal – www.sme.org/iramp/
- 3D PDF Consortium
 - www.3dpdfconsortium.org

Other Questions / Comments





Next PWG Face-to-Face Meeting

November 13-14: Virtual

Monitor pwg-announce@pwg.org or the [PWG meeting page](#) for more info.

Any companies interested in hosting a PWG face-to-face, please contact chair@pwg.org