Internet Printing Protocol Workgroup Meeting Minutes
November 14-15, 2018

Meeting was called to order at approximately 10:15am MT on November 14, 2018 and 11:30am MT on November 15, 2018.

Attendees

Gupta Gyaneshwar (Oki Data)
Sean Kau (Google)
Smith Kennedy (HP)
Jeremy Leber (Lexmark)
Ira McDonald (High North)
Jeremy Reitz (Xerox)
Michael Sweet (Apple)
Paul Tykodi (TCS)
Bill Wagner (TIC)
Rick Yardumian (Canon)

Agenda Items

1. IP Policy and Minute Taker
    - http://www.pwg.org/chair/membership_docs/pwg-ip-policy.pdf
    - IP policy accepted, Mike taking minutes
2. Slides
    - https://ftp.pwg.org/pub/pwg/ipp/slides/ipp-wg-agenda-november-18.pdf
    - Slide 10: Latest version of self-cert manual is July 4th
3. IPP Everywhere™ v1.1
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeve11-20180926-rev.pdf
    - Q: Should we list recommended attributes?
        - job-password-repertoire-supported, jpeg-features-supported, some others
        - Would also make sense for IPP Privacy Attributes
        - A: Continue discussion on the mailing list, get closure on final list to add
        - Could also reference/recommend additional specs that could be used in addition to IPP Everywhere for specific functionality:
            - IPP Transaction-Based Printing - enterprise/managed printing
            - IPP Shared Infrastructure Extensions - cloud printing
    - Printer vendor comment: spec is hard to read/implement from?
        - Q: Do these vendors also implement other IPP-based "standards" (Mopria, Wi-Fi Direct, AirPrint, etc.)?
            - A: ???
        - Q: Are client-side issues (what attributes are supported)

        contributing to confusion?
            - A: Possibly, but not limited to that
        - Q: Need a white paper to help vendors know what needs to be implemented?
            - Like a cheat sheet? Yes
            - A: Maybe add something to the introduction?
        - Q: What is the relationship between IPP Everywhere and other standards?
            - A: Hard to document on the PWG site because of legal issues
        - (Brief) examples would be useful
        - Could break tables up by feature
        - Also add informative references for IPP Sample code and sample IPP Everywhere printers
            - Also useful resource for Client developers
        - Be careful not to make this spec a lot longer (already a "big" spec)
        - Q: How to help vendors implement things?
            - A: Dynamic web page/content, separate IPP tests, feature tests, etc.
            - Good Google Summer of Code 2019 project
            - Maybe add variables to self-cert tests
            - Also a tool to examine printer description attributes and list capabilities from a client perspective
            - Continue discussing on mailing list
    - Action: Mike to post summary of proposed IPP Everywhere 1.1 spec changes
    - Self-Certification:
        - Some way to certify certain features?
        - Client certification?
4. Github Submission of IPP Everywhere™ Self-Certifications
    - Q: Pull requests for submissions?
        - A: Sure, but that might be a barrier for some submitters (not familiar with Git, Github, or pull requests)
    - Q: Can this be put in a separate repository?
        - A: Sure, might be a reasonable solution
        - Will make pull requests easier, but would need to duplicate some template content
    - Continue discussions about ways to reduce the amount of work needed to add new submissions
5. IPP 3D Liaisons
    - Lots of work with concrete printing for construction
        - R&D with 6-10 schools
        - Using G-code
        - Looking at using IPP with common sample files to reduce the number of variables and improve consistency
6. IPP 3D Printing Extensions v1.1
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipp3d11-20180704-rev.pdf

    - Waiting for some feedback, but we have prototyping in ippserver
    - Add a sub-heading for material-type values from other standards bodies (8.1.3.x.1), plus a forward reference from the beginning of 8.1.3.x.
    - Action: Paul to get a list of common concrete standards that can be shown as example material-type values, maybe other environmental values?
    - Next status will be stable at the beginning of 2019
    - Work with concrete printing folks to define material-type values:
        - Show how to map standard names to IPP

7. PWG Safe G-Code Subset for 3D Printing
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-pwgsafegcode10-20180704-rev.pdf
    - Confident with the content, move to last call at the beginning of 2019
8. IPP System Service v1.0
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippsystem10-20180701-rev.pdf
    - Q: How to monitor multiple printer objects for state changes?
        - A: System subscription can do this, but we don't talk about subscription template attributes or required notify-events values from RFC 3995
    - Add notify-events "printer-xxx" values as REQUIRED for Create-System-Subscriptions
    - Add notify-printer-ids (1setOf integer(1:65553) Subscription Template attribute to limit system subscriptions to specific printers
    - Expand discussion of subscription template attributes in Create-System-Subscriptions request
    - Q: How would printers that go offline/downed link be reported with subscriptions?
        - A: printer-state-reasons changes reported
    - Double-check that the use cases cover monitoring multiple printers via the system
    - Action: Smith to post system notification discussion to IPP mailing list
9. IPP Authentication Methods
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippauth-20181109-rev.pdf
    - Section 1:
        - "or one of the HTTP or TLS authentication methods"
            - More than just certificate authentication, although we currently do not define values for uri-authentication-supported or status code values for PSK, etc.
        - Lines 96-98: Reword, lowercase web browser, "since" instead of "But an IPP Client"
    - Section 4:
        - Line 193: system->service, may->might
        - Line 200: Remove comma between "indirectly" and "by"
        - Add reference to SAML core spec
        - Q: How to implement SAML-OAuth2 gateway
            - A: Several existing implementations that can be found through a web search - IBM, Oracle, and many others provide them
            - Maybe say that the bridge typically uses the SAML 2.0

assertion is used as/transformed to an OAuth 2.0 Bearer token - see https://connect2id.com/blog/how-to-bridge-saml-and-oauth

- Global: Make sure cross-references are up-to-date
- Global: For auth diagrams, strip the failures and just show them separately (same sequence for all HTTP auth methods):
    - 401 unauthorized is when there is no auth data or bad auth data
    - 403 forbidden is when there is valid auth data but access is not allowed
- Section 4.6: Reword SAML reference (maybe "authentication services"?)
- Section 5.1.2:
    - Line 310: Fix lowercase SHOULD, drop "only", remove comma before "and"
- Section 5.1.3:
    - For HTTP authentication, HTTP 403 Forbidden is returned for authorization failures (authentication succeeded, authorization failed)
    - For TLS authentication, HTTP 200 OK is returned for authorization failures with an IPP message body, status code is 'client-error-forbidden'
    - Client SHOULD stop on an authorization failure
    - Rewrite as needed
- Section 5.2.1:
    - For HTTP, return 401. For TLS, return 200 OK and client-error-not-authenticated
    - MUST or declarative language. Not SHOULD.
    - Add RFC 8010/8011 reference (not sure which has HTTP/TLS authentication references)
    - Rewrite as needed
- Section 5.2.2:
    - For HTTP, return 403 forbidden. For TLS, return 200 OK and client-error-not-authorized or client-error-forbidden as appropriate.
    - Start with "If the Client credentials have been authenticated, ..."
    - MUST or declarative language. Not SHOULD.
    - Add RFC 8010/8011 reference (not sure which has HTTP/TLS authentication references)
    - Rewrite as needed
- Global: 401 Unauthorized, 403 Forbidden

10. IPP Job and Printer Extensions - Set 2 v2.0
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippjobprinterext2v20-20180904.pdf
    - https://ftp.pwg.org//pub/pwg/ipp/slides/IPP-Job-Storage-v2-20181116.pdf
    - Slide 5:
        - Hold Job Until User Release - User authentication could be a new job-hold-until keyword ("user-release", "console-release", etc.)
        - Defining a new job password attribute is problematic from a implementation/interop standpoint
        - Can't change semantics of existing attributes wholesale

        - Amendments/extensions are possible, need to tread carefully
- Job Save:
    - Need to fully define the feature, limit appropriately
    - Don't want to create a document storage solution or store "opaque blobs" representing the Job and Document objects
    - Current JPS2 basically defines storage of output, not the original document(s) and job object/ticket
    - Not a goal to save the original IPP messages and documents to a specified location, just to have an internal form of the job that can be resubmitted
        - We need a "retained" job that can be resubmitted
    - CUPS concept of job save is job retention - auto-saved for 24 hours currently, shows up in the job history, user clicks on "reprint" button to print the saved job
    - Reprint should not use xxx-actuals - semantics of Resubmit-Job, etc. use the original job template attributes and clear out status attributes from the original job
        - Make sure to spell this out and reference RFC 8011
    - Use case for "job save with password" would allow any user to reprint that job (if they have the password)
        - Can definitely use the existing Job History mechanism
        - Probably add a job-state-reasons keyword for it, in addition to whatever attributes
    - Q: Resubmit-Job/Get-Jobs/Get-Job-Attributes are normally limited to Owner/Operator/Adminstrator, isn't "job reprint by anyone" incompatible?
        - A: RFC 8011 does provide some "wiggle room", can extend the semantics of Resubmit-Job to require the password OR do it from the console
        - PIN printing isn't particularly secure anyways...
        - Need to define this carefully because of the security considerations
            - Don't want to re-invent users, groups, etc.
- Proof print and job save are both examples of retained jobs being used for different things
- New list of use cases:
    - Proof Print
    - Reprint with Password
    - Retain Job for Specified Time Period
    - Hold Job with Password
    - Hold Job until Released At Printer (NFC, Bluetooth, etc.)
        - Mainly need job-state-reasons keyword to tell client the user needs to go to the printer to release it
        - job-hold-until=indefinite is enough to hold the job, maybe have another to explicitly request a console hold ("console")

- Printer associates some identity at the printer to the identity of the job owner

- Slide 7:
  - Consensus: deprecate job-save-disposition - doesn't satisfy use cases, not interoperable
  - Consensus: keep proof-print, clearly defined and no reason to kill it...
    - Add job-retain-until-* to clearly define job retention period
  - Consensus: keep job-password & friends
    - Add job-password-repertoire-xxx
    - Release-Job should be extended to support job-password operation attribute to release remotely
- Slide 8:
  - Consensus: Add "job-resubmit-password-xxx" attributes
    - Avoid "reprint" in the name since it has to be used with Resubmit-Job operation (or console input)
    - Implicitly retains job
    - Duration of retention controlled by job-retain-until-xxx value.
  - Consensus: "job-retain-until (keyword)" and "job-retain-until-time (dateTime)"
- Addition to Resubmit-Job semantics:
  - Doesn't preserve job-resubmit-password-xxx in new job object (just like job-password)
  - Doesn't preserve job-retain-until-xxx in new job object (just like job-hold-until)
  - Client MUST specify job-resubmit-password-xxx for jobs with a password
- Saved Job -> "Public Job" or "Shared Retained Job"
  - Retained, accessible to all users
  - Needs further discussion
  - Possible intersection with privacy attributes
  - We've never done access control lists before...
- Save Only (without print)
  - Attribute or value to specify for this?
  - Semantics - should the job be held, or be in the processing-stopped state, or go to completed state and need to be reprinted?
  - job-save-disposition provided a way to specify save-only, job ended up completed
    - completed makes the life cycle consistent and clearly defined
    - processing-stopped has the job in limbo
    - held has the job retained indefinitely but never processed
    - errors during processing can then be caught - unprintable job gets moved to aborted state - clearly tells client whether job can be resubmitted
  - "retain only", "process only", "preflight job", etc.
  - Continue discussion on mailing list

11. MFD Alerts v1.1
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-pmpmfdalerts10-20180813-rev.pdf
    - New filename: wd-pwgmfdalerts11-yyyymmdd.ext
    - New title: PWG MFD Alerts v1.1
    - Section 2.3:
        - Rename Client and Printer to IPP Client and IPP Printer
        - Rename Printer MIB Agent to "SNMP Printer"
        - Rename Printer MIB Client to "SNMP Client"
        - Global: Make protocol role terminology changes throughout
    - Section 4:
        - Update to reference corresponding IPP specs
        - Drop Semantic Model figures
        - Do we want any of the other subunits as IPP attributes?
            - System object doesn't roll-up subunit attributes/values
            - State keywords are rolled up
            - Maybe something for generic ABNF mapping for other subunits as Printer Status attributes
                - Already do finishers, input-trays, markers, and output-trays
    - Section 4.x:
        - Do we retain these? Decide based on what gets done in section 4.
    - Section 5.1:
        - Should we rename some of these to XxxAlert instead of XxxError?
            - Add a note that keywords ending in "Error" only occur when the printer is stopped
        - Rename any XxxError that doesn't stop the printer
            - e.g. faxModelProtocolError is transient (and other faxModem values)
        - Go through faxModem alerts - don't register IPP keywords for transients, add "--Deprecated" (or something like that) in the SNMP MIB
    - Section 5.2:
        - A bunch of the keywords have -error on the end.
            - Make xxx-alert or just xxx
        - Convention used in prior registrations is to keep -error when the only value suffix is -error
        - scan-media-pathinput-feed-error should be scan-media-path-input-feed-error (missing hyphen)
        - Add a note that keywords ending in "-error" only occur when the printer is stopped
    - Section 6.1:
        - Title: SNMP Printer Conformance Requirements
        - ... for SNMP Printers (Agents) conforming to the Printer MIB v2 [RFC3805] ...
    - Section 6.2:
        - Title: SNMP Client Conformance Requirements
        - ... for SNMP Clients (Managers) conforming to the Printer MIB v2

        [RFC3805] ...
    - Section 7.1:
        - Check formatting of list.
    - Section 8.1:
        - Title: IPP Security Considerations
    - Section 8.2:
        - Title: SNMP Security Considerations
        - Just say "same as RFC 3805"
    - Section 9.4: Drop
    - Section 9.3: Merge with 9.5
    - Section 9.6: Drop
    - Section 9.7: Drop
    - Section 9.8: Drop
    - Section 10.1: Use STD92 reference, Unicode 11, BCP14 instead of RFC2119
    - Section 10.2: Drop WSDM/etc. references we don't use
    - Global: RFC8011 -> STD92
    - Update authors and contributors - add Rick Yardumian and Christopher Rizzo, Jerry Thrasher is no longer with Lexmark

12. IPP Document Object v1.1
    - https://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippdocobject11-20181022-rev.pdf
    - Global: Fix references!
    - Section 10.2:
        - note should say "does not obsolete the original operation or Job Status attributes..."
    - Next status should be prototype

Next Steps / Open Actions

- Next conference call on December 8, 2018 at 3pm ET
- Action: Mike to post summary of proposed IPP Everywhere 1.1 spec changes
- Action: Paul to get a list of common concrete standards that can be shown as example material-type values, maybe other environmental values?
- Action: Smith to post system notification discussion to IPP mailing list
- Action: Paul/Smith to determine whether ISTO needs to do anything to participate in ISO SG12 (IN PROGRESS)
- Action: Mike to investigate IPPS issue in Wireshark - “ipp” filter not working (PENDING)
- Action: Smith to follow-up on the 3MF liaison agreement (IN PROGRESS - on agenda for Belfast 3MF meeting, working on joint press release)