Internet Printing Protocol Workgroup Meeting Minutes
August 9-10, 2017

Meeting was called to order at approximately 1:00pm ET on August 9, 2017.

Attendees

Danny Brennan
Gupta Gyaneshwar (Oki Data)
Smith Kennedy (HP)
Jeremy Leber (Lexmark)
Ira McDonald (High North)
Alan Sukert (Xerox)
Michael Sweet (Apple)
Paul Tykodi (TCS)
Bill Wagner (TIC)
Rick Yardumian (Canon)

Agenda Items

1. IP Policy and Minute Taker
    - IP policy accepted, Mike taking minutes
2. Slides
    - http://ftp.pwg.org/pub/pwg/ipp/slides/ipp-wg-agenda-august-2017.pdf
    - Action: Mike/Ira to request IESG change of status for RFC 8010/8011 to Internet Standard
3. IPP System Service (Mike/Ira)
    - http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippsystem10-20170719-rev.pdf
    - Table 1:
        - resource-settable-attributes-supported maps to job-settable-attributes-supported
        - system-default-printer-id maps to <none>
        - "SM Element Name" -> "SM/IPP Equivalent"
        - Add note concerning "none" in the SM/IPP column means there is no equivalent and the attribute is defined for the first time in this specification.
    - Global: Drop "[PWG.SYS]" from reference columns in tables, change "SM Element Name" to "SM/IPP Equivalent", use level 2 section references instead?
    - Table 2:
        - "system-strings-uri" should use "printer-strings-uri" analogue
    - Table 3:
        - "SM Operation Name" -> "SM/IPP/DPA Equivalent"
        - Add note/intro that almost all operations are required, Register-Output-Device is conditional

- Add operation IDs from reg template
- Table 5:
    - "date-time-at-xxx" -> "date-time-at-xx" with RFC8011 reference, fix notes
    - "time-at-installed" -> "time-at-processing"
- Section 6:
    - Rewrite intro paragraph
        - IPP System Service implementations MUST support Client authentication and Client authorization based on System policy.
        - Except for Get-Printer-Attributes, all System Service operations MAY require Client authentication.
        - Clients MUST support HTTP Basic authentication and SHOULD support HTTP Digest authentication [RFC8011]
        - Note: Get-Printer-Attributes does not require authentication for backwards compatibility with existing Clients.
- Global: Work on "authorized Operator or Administrator" wording - may or may not be authenticated at HTTP level, might use Client address or certificate for authorization, etc.
- Section 6.x:
    - "Printer Operations"
    - Add new Get-Printer-Resources as a user operation on a Printer vs. Get-Resources admin operation on the System object.
        - Similar access rights as Get-Printers (most authenticated user specifies the filter)
    - Add Get-User-Printer-Attributes as a user operation on a Printer
        - Defined as per existing white paper
- Section 6.1:
    - Title: "System Printer Operations"
- Move Get-Printer-Attributes to a separate section "Amended Semantics for Existing ..."
- Section 6.1.5:
    - Rename Get-Printers to Get-User-Printers
- Section 6.2.7.1:
    - Remove space in title "Set- Resource-Attributes"
- HTTP PUT of resources to printer-resource-uri
    - Internally does Create-Resource, Send-Resource-Data, Install-Resource, and Allocate-Printer-Resources operations
    - Q: For presets, do we want to define a printer operation to upload/ store presets?
        - A: Further discussion needed, but existing Set-Printer-Attributes can set proposed presets attributes, which could reference allocated resource-ids.
- Section 6.3.1:
    - "one or more System Subscription objects on Resources."
- Section 6.3.2:
    - "one or more System Subscription objects."

- Section 6.4.4.1:
    - "then the System MUST <return> all of the System"
    - "xxx-supported-attributes" -> "xxx-supported" attributes.
- Global: Check for "System MUST all"
- Section 6.4.5:
    - "with the 'moving-to-paused' value removed from THEIR ..."
- Global: Check for "value removed from "printer-state-reasons" - add "THEIR"
- Section 6.4.6:
    - Line 2213: Add "THEIR" before "printer-state-reasons".
- Global: Talk about propagation of "printer-message-from-operator" value to Printer object in corresponding operations
- Section 6.4.7:
    - Line 2376: "Access Rights: ... of System object. Otherwise, the System MJST ..."
    - "Infrastructure Printer" -> "System"
    - "output-device-uuid" (uri(45))
- Global: Check that all xxx-uuid attributes use syntax of "uri(45)" since they are RFC 4122 UUID URNs.
- Section 6.4.6:
    - Add sentences about the affect on the system state (might, since it may or may not create a Printer object)
- Section 6.4.6.2:
    - Line 2422: Missing hyphen in "printer-is-accepting-jobs"
    - Add Group 4: System Attributes
- Global: Check for "printer-is-acceptingjobs", add missing hyphen
- Section 6.4.8:
    - Add state change diagram?
    - Talk about its use as a "cleanup" operation (restore system to known state, "software rejuvenation", etc.)
    - "with the most recently installed firmware."
    - Talk about "system-message-from-operator" getting copied to Printer objects.
    - Maybe talk about sending any notifications for subscribed shutdown or state change events before shutting down
- Shutdown-Xxx-Printers and Startup-Xxx-Printers should send event notifications
- Enable-Xxx-Printers, Disable-Xxx-Printers, Shutdown-Xxx-Printers, and Startup-Xxx-Printers should copy xxx-message-from-operator to Printer object
- Section 6.4.8.2:
    - Line 2476: should -> SHOULD
- Section 7.1.15:
    - Create-Resources -> Create-Resource
- Section 7.1.17:
    - "specifies THE interval"
- Section 7.2.4:

- Add "semantically analogous ..."
- Section 7.2.5:
    - This REQUIRED System attribute (add System)
- Section 7.7.8:
    - "are SHOWN in Figure"
- Global: "are show in" -> "are shown in"
- Section 13.x:
    - Verify attribute names and syntaxes
    - Use Example style for reg templates
- Section 16.2.1: Work on title
4. IPP Presets (Smith)
    - http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170807.pdf
    - http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ipp-preset-20170807-rev.pdf
    - Section 2.2:
        - "All of the printing terminology ... IS applicable here."
    - Section 3.1:
        - "ought to still allow" -> "should allow"
        - "For example, if a preset includes a "print-quality" of 'high' (5) and a "print-color-mode" of 'color', the Client should allow the User to change the "print-quality" to 'normal' (4)."
        - Add reference to PWG Semantic Model
    - Section 3.2:
        - Line 135 (Explicit Preset Selection): Should be level 3 heading
        - Lines 139-142: Overrides could be listed as an Exception
    - Section 3.2.1:
        - Line 145: Reword - an existing preset?
        - Line 146: "trigger to apply a preset that includes"
    - Not important to talk about where the presets and triggers are coming from/being stored in the use cases and exceptions, but the design requirements need to focus on the interchange format of these presets and triggers (as IPP attributes)
        - Printer support is limited to supporting the attributes, but doesn't have to do anything beyond storing and returning the attributes and their values.
        - The burden is on the Client
    - Section 3.2.2:
        - Title: Client Storing a Preset to Printer
        - Drop "on his system"
        - Line 153: "locally stored" (not created)
        - "Store Preset on Printer"
    - Global: Add Preset and Trigger to defined terms in section 2.x
    - Section 3.4:
        - User presentation of these options -> The user interface for Presets
        - Also see IPP specs for other boilerplate
    - Section 3.5:
        - Import boilerplate IANA/IPP requirements
    - Section 4:

- Title: "IPP Preset Definitions"
  - "This section defines the IPP attributes and operations used for Presets and Triggers"
- New Section 4.1: "Printer Description Attributes"
- Section 4.1.x: job-xxx-supported (1setOf collection)
- Section 4.1 (job-presets-supported)
  - "This REQUIRED Printer Description attribute lists named Presets that are stored on the Printer. Each collection value contains a REQUIRED "preset-name (keyword/name(MAX))" member attribute and one or more Job Template attributes that are part of the Preset."
  - Drop sentence about requiring if job-triggers is supported
- Section 4.1.1:
  - Title: preset-name (keyword | name(MAX))
  - Lines 197-200: This member attribute provides a unique name for the Preset.
  - Lines 201-205: Keyword values can be localized using the message catalog provided at the URL specified by the "printer-strings-uri" Printer Description attribute [PWG5100.13]
- Section 4.1.2;
  - Add reference to PAPI spec.
  - Update to use "preset-name"
- Section 4.2 (job-triggers-supported)
  - "This RECOMMENDED Printer Description attribute lists Triggers that are stored on the Printer. Each collection value contains a REQUIRED "preset-name (keyword | name(MAX))" member attribute (section 4.1.1) and one or more Job Template attributes that are part of the Trigger."
  - Delete lines 223-224
  - Move lines 220-222 (client stuff) to new section 5
- Global: Change "preset-key" to "preset-name"
- New Section 4.2: "Storing Presets and Triggers"
  - Talk about using Set-Printer-Attributes operation, listing "job-presets-supported" and "job-triggers-supported" in "printer-settable-attributes-supported", etc.
- New Section 4.3: "Using Resources"
  - Talk about resource-ids member attributes in job-presets-supported collection to include Job Template and other resources in the Job Ticket.
  - Reference to IPP System Service spec
- New Section 5: "Client Implementation Guidance/Guidelines" section:
  - (May also be described in use cases and exceptions to frame the requirements)
  - Talk about what happens when a triggered preset overrides a user selection?
    - Maybe a user overriding a preset SHOULD stop application of any other triggers

- Also talk about triggers only being applied in response to a user selection (not attribute changes from other presets or automatic selections the Client software might do, e.g. disabling duplex for a 1-page document)
  - New Section 6: "Conformance"
  - New Section 6.1: "Client Conformance Recommendations"
    - Pointers to SHOULDs, etc. in prior sections for Client
  - New Section 6.2: "Printer Conformance Requirements"
    - Pointers to sections for Printer
1. IPP Get-User-Printer-Attributes
   - http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-userop-20170801-rev.pdf
   - Section 3/4: Update to titles like in IPP Presets
   - Section 5.1:
     - "is semantically analogous to the Get-Printer-Attributes operation [RFC8011] except that the Printer MUST return the attributes and values allowed for the most authenticated user. The Client MUST ..."
     - Lines 168-171: Reference RFC 8010/8011 for HTTP Authentication and TLS requirements for Clients and Printers.
     - Most authenticated user provides identity for policy lookup (what attributes and values are returned)
     - This operation allows and authorized user to obtain a list of attributes and values that can be used by the most authenticated user. (say this better)
   - Section 5.1.1:
     - Drop "Natural Language", "Target", "Requesting User Name", etc. intermediate titles
     - List attributes (can group attributes-xxx and requesting-user-xxx attributes together before description)
     - The "requesting-user-name", "requesting-user-uuid", and "requesting-user-vcard" attributes SHOULD be supplied by the Client and MUST be supported by the Printer.
     - The "requested-attributes" attribute MAY be supplied by the Client and MUST be supported by the Printer. This attribute lists the attributes or attribute groups to include in the response [RFC8011].
     - Similar changes (Client MAY/SHOULD/MUST supply and Printer MUST support ...) for other operation attributes.
   - Section 5.1.2:
     - Double check against latest IPP System Service draft
   - Q: Should this be part of IPP System Service?
     - A: Probably not, not directly related and the conformance requirements don't line up, plus it "hides" the operation in the rest of the spec.
   - Q: What about a standalone spec?
     - A: Not a significantly different operation from existing Get-Printer-Attributes, don't think it requires that level of scrutiny
   - Stay as white paper, update status to interim...

- Process discussion:
    - Should issue Stable draft when we are happy
    - Top-right of title page should say "IPP Registration"
    - After successful IPP WG last call, status changed to "Approved"
    - Use "reg-" prefix for approved document, store in new "pub/pwg/ipp/registrations" directory on FTP server
    - Process:
        - Issue stable draft
        - Do IPP WG last call
        - Issue approved draft with "reg-" prefix and upload to registrations directory
        - Announce on IPP WG mailing list with IANA registration template
        - IANA registration references the IPP mailing list archive
    - Add new "Registrations" section on IPP WG home page
    - Move Raster Analysis to historical
    - Make Working Drafts with Standards Track and White Papers sub headings
    - Action: Mike to send summary of IPP registration document process to SC
2. IPP Authentication:
    - http://ftp.pwg.org/pub/pwg/ipp/whitepaper/tb-ippauth-20170803.pdf
    - Abstract: "This white paper describes the interaction between IPP and various HTTP authentication mechanisms."
    - Section 1: Use abstract text plus list the authentication methods.
    - Q: What is the intended future of this document?
        - A: Best Practices
    - Section 3:
        - Use IIG 2.0's requirements/rationale organization
        - Talk about implementation challenges, this is a guide for implementation
    - Sections 3.x should probably be 4.x.
    - Sections 3.1.x: Drop "IPP" from titles
    - Global: "Authentication Method" -> "authentication method" (except in titles)
    - Section 3.1:
        - Add discussion about 'none' value indicating an open Printer while other values limit access.
        - Talk about "uri-authentication-supported" really being how IPP is obtaining a user identify for authorization. In some cases the values are in-band HTTP authentication mechanisms while others are out-of-band (certificate) or blind trust (requesting-user-name).
    - Section 3.1.1:
        - Rewrite first paragraph - more direct, less passive
        - Lines 94-96: The Printer uses the "requesting-user-name" operation attribute to obtain the "job-originating-user-name" value in Jobs. The Printer authorizes requests using the 'anonymous' user access

rights.
- Section 3.1.2:
    - Rewrite intro
    - Lines 102-103: The Printer does not authenticate the user identity and trusts whatever the Clients in a request. (or something like that)
- Section 3.1.3:
    - Move client UI considerations to a new Implementation Guidelines section
    - Talk about the Client re-sending IPP request with Authorization header containing plaintext username and password
- Section 3.1.4:
    - Same as for 3.1.3
- Section 3.1.5:
    - Work with Mike on filling this out
- Discussion about TLS Certificates
    - "uri-authentication-supported" = 'certificate' implies a pairing (potentially out of band) that allows the Printer to authorize a Client using that certificate (and associate it with a local user)
    - "uri-authentication-supported" = 'none' still allows a Printer to use the X.509 client certificate as a more authoritative source of requesting-user-xxx (and can validate the info is signed by a trusted CA, etc.)
    - HTTP MutualAuth scheme goes into some details about this
    - "Pairing" of client certificates with user identity happens out-of-band with IPP (e.g. HTTPS web page)
- Q: What if both Basic and Digest are supported?
    - A: List the same printer-uri-supported value(s) twice, with corresponding "uri-authentication-supported" values.
    - Worth including in this document to describe how this works.
    - HTTP WWW-Authenticate header is multi-valued (and would list both Basic and Digest)
- Section 3.1.6:
    - Step 22: POST needs "Authorization: Bearer <access-token-value>" added
    - Work with Mike to refine the example a bit
    - Often username+password followed by some 2-factor info
- Internationalization considerations:
    - Talk about interop problems with Unicode usernames and passwords
    - Pluggable Authentication Modules (PAM) on UNIX platforms has issues as well (for server-side authentication)
3. Discussion of 3D Topics
    - Participation in AMSC:
        - How to get other groups to understand how IPP/PWG can work for 3D printers?
        - American Welding Society (AWS) working on a D20.1 specification for metal printing

- http://www.aws.org
- D20 is the additive manufacturing committee in AWS
  - http://www.aws.org/standards/ CommitteesAndStandardsProgram/d20-committee-on-additive-manufacturing-2
- D20.1 is a specification for metal printing that is representative of what metal powder printing does and is capable of (and will be widely accepted)
- Need to review this document, which requires a liaison with AWS:
  - Action: Paul to forward the AWS liaison process to the SC
  - Paul needs to respond to AWS rep to start liaison process
- Create a short slide deck once we have access showing how D20.1 can be mapped to/from IPP
- Paul needs to make sure there is a connection between D20.1 and IPP at the AMSC 2 meeting
- ASTM liaison needed to interface with DICOM (Digital Imaging and Communications in Medicine) medical imaging/3D printing wrapper standards
  - https://en.wikipedia.org/wiki/DICOM
  - Extending DICOM for 3D printing, need wrapper to contain requirements, etc. (job ticket)
  - Probably most interested in the semantic model schema
  - Other ISO and IEEE (P3030 and P3353) liaisons in progress for related efforts
- Also need to update our information with ISO
  - Ira to provide information on ISO DPA
  - Provide updates of 3D specs
  - Need by Monday, August 28th
  - Action: Paul to send copy of ISO working document to SC list
1. Next Steps
   - Review white paper template
     - Talk about types of white paper documents: IPP Registration documents, etc.
     - Include list of types and prefixes
     - More guidance on what to call things, what would get changed, etc.

Next Steps / Open Actions

- Next IPP WG conference call on Thursday, August 17, 2017 from 3:00-4:30pm ET
- Review white paper template
- Action: Mike/Ira to request IESG change of status for RFC 8010/8011 to Internet Standard

- Action: Mike to send summary of IPP registration document process to SC
- Action: Paul to forward the AWS liaison process to the SC
- Action: Paul to send copy of ISO working document to SC list
- Action: Mike to update document templates to use "this document" instead of "this spec" or "this standard" (PENDING)
- Action: Mike to review document template boilerplate and recommend changes and simplifications (PENDING)
- Action: Smith to write up job-password/job-save-disposition/resubmit use cases/ requirements (PENDING)
- Action: Mike to document ippserver setup on Raspberry Pi for 3D (IN PROGRESS)
- Action: Mike to look at document template to fix level 3 headings which are not bold (ONGOING - template is correct, Mike will look at the System Service document instead)