Internet Printing Protocol Workgroup Meeting Minutes
February 10 and 11, 2016

Meeting was called to order at approximately 1:00pm PT on February 10, 2016 and 9:00am PT on February 11, 2016.

Attendees

Gavin Bridgeman (TECHSOFT 3D)
Kim Engedahl (MPI Tech)
Matthew Hardy (Adobe Systems)
Gyaneshwar C Gupta (Oki Data - call in)
Don Jacob (Bluebeam Software)
Smith Kennedy (HP)
Emmet Lalish (3MF/Microsoft - call in)
Daniel Manchala (Xerox)
Ira McDonald (High North - call in)
Peter Noyes (Bluebeam Software)
Mike Scrutton (Adobe Systems)
Ole Skov (MPI Tech)
Phil Spreier (3D PDF Consortium)
Mike Sweet (Apple)
Paul Tykodi (TCS - call in)
William 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-february-16.pdf
3. IETF IPP/1.1
    - http://tools.ietf.org/html/draft-sweet-rfc2911bis-07
    - Section 2.3.3 (End User):
        - Capitalize Printer, Print Job
    - Section ?? (Print-Job Response)
        - Drop colon after “next attribute” for job-state, drop “next” (along with the value of the “job-state-reasons” attribute)
    - RFC 7612 reference has wrong title
    - Action: Mike to post updated RFC2911bis
    - Ready to take to IETF
4. IPP System Service
    - http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippsystem10-20160117-rev.pdf
    - Global: Administrator, Operator, End User (instead of User, e.g. “End User

Operation")
- Global: Change "specifies a list of" to "lists"
- General: Review existing attribute descriptions with RFC2911bis
- Section 2: Add Administrator, Operator, End User definitions from RFC2911bis
- Section 7.2.1:
  - "identities the charset that is used to represent"
  - "MUST be one of the values of …"
  - Add reference to section 7.2.2 (charset-supported)
- Section 7.2.2:
  - "identified the set of charsets that are supported for values of attribute with …"
  - "The value 'utf-8' MUST …"
  - Drop last sentence in first paragraph ("If a System object supports …")
  - Drop second paragraph ("If more charsets …")
- Section 7.2.3:
  - This REQUIRED System attribute identifies the supported IPP protocol version(s) and is semantically analogous to the "ipp-versions-supported" Printer attribute defined in [RFC2911].
- Section 7.2.x:
  - Reduce to one sentence description with reference to 2911, as appropriate.
- Section 7.2.7/8/9:
  - Add subsections for member attributes.
  - Also check whether there are any dependencies between attributes
  - "… attribute lists the configured …"
  - Add "-policy" to the names
- Section 7.2.10:
  - system-default-printer-uri (uri | no-value)
  - Add reference to the section that talks about bootstrapping/support for default destination at "/ipp/print"
  - Talk about 'no-value' out-of-band value when
- Add use case section on bootstrapping client access to default print service
- Section 7.2.12:
  - system-geo-location (uri | unknown)
  - "specifies THE location of the System using a 'geo:' URI [RFC5870]."
  - "When the location is unknown, Systems MUST return the 'unknown' out-of-band value."
- Section 7.2.18/19
  - Add references to point to counterpart
  - "Systems that support the Set-System-Attributes operation MUST support this attribute" (as a separate sentence instead of "and is REQUIRED …"
  - Combine into a collection "system-owner (collection)", uri and vcard

        are member attributes
        - When set, must provide complete value
        - uri and vCard are required member attributes
    - Section 7.3.1/2/3/4/5/6/7:
        - Add subsections for member attributes
    - Q: Can you get notifications for power attribute changes?
        - A: Yes, 'system-config-change' for System Description attributes, 'system-state-change' for System Status attributes
    - Q: Does the system service require support for notifications?
        - A: Not sure, but it should be required (required for INFRA, printers are more capable these days and if they can implement the system service adding ippget notifications isn't a high bar)
        - ippsample code supports notifications with just a little code
    - Q: Does power-transition need to be READ-WRITE (to allow configuration of a subset of supported values)?
        - A: READ-ONLY in the MIB…
        - Add a section "4.x Power Management" that explains why the administrator cannot limit the state transitions and other hardware capabilities
        - Or just extend MIB to allow for configurability?
    - Q: Do we want to raise conformance requirements for power?
        - Not unconditionally - won't be using it for cloud/infrastructure servers…
        - A: No
    - Section 7.3.8 (system-config-changes):
        - Q: Does it persist across power cycles/shutdown?
            - A: Unknown, doesn't say in the Printer MIB
            - Define as "number of changes since the system started".
        - Q: Add "printer-config-changes (integer(0:MAX))" Printer Status attribute?
            - A: Possibly
    - Section 7.3.9:
        - Add member attributes for short list (not full LDAP set)
    - Section 7.3.10:
        - Add member attributes for short list
    - Section 7.3.11:
        - Add member attributes for short list
    - Section 7.3.12 (system-current-time)
        - Move to System Description
        - Note the change from SM System Service - needs to be fixed in SM3
    - Section 7.3.13 (system-health)
        - Add member attributes
        - Q: What does this contain? Does it cover all services or just the system?
    - Stopped at 7.3.13
5. (February 11) Slides/3D Discussion

- 3MF:
  - Out for a year (as a public standard)
  - Major vendor support/participation, including Ultimaker, GE, Stratisys, Autodesk, etc.
  - Reference implementation:
    - Issues on Mac, want to get it working across all platforms
  - Support:
    - Windows 10 supports 3MF
    - Cura now supports 3MF
    - SolidWorks supports writing as 3MF
    - Autodesk supports writing 3MF in some of their products
    - Other CAD vendors working on it
  - Focus is on manufacturing - orientation and position are "baked in"
  - Supports and rafts can be embedded in file
- PDF 3D
  - U3D is the old 3D format and was part of ISO 32000
  - PRC is the new 3D format, includes tolerance information (probably what we want to use)
  - Can have multiple objects
  - Interactive
  - Stratasys adoption
  - SolidWorks World announcement - interchange, workflow with PDF
  - Also for interchange
  - Adobe Reader supports for 10 years
  - Focus on late binding to device (what we want)
  - How to identify an object?
    - Every object has a UUID
    - Have an attribute specifying a list/set of UUIDs
    - Could also do page-ranges (print all objects on numbered pages)
  - What to do if no UUIDs are selected?
    - Expectation is to print everything (if you are printing it)
    - Console printing might offer choices
  - Do you filter out content that isn't getting printed?
    - Can be done by client software, but usual issues of pre-processing and potential loss of data/detail
  - Objects can be pre-arranged (coordinates set in geometry) or can be positioned by printer (when printing multiple objects)
  - Not sure if support/raft materials can be specified without geometry.
  - PDF/E 1 (based on PDF 1.7) published for a few years
  - PDF/E 2 (based on PDF 2.0)
  - Focus of PDF/E is archival and exchange, subsets of corresponding PDF specs
- If object is bigger than build volume?
  - Exception unless told otherwise
  - Would not want to slice automatically - needs human interaction to design split

        - Scaling? OK for some situations, but again not automatic
    - Optimizing position and orientation?
        - Could provide an attribute to allow printer to optimize, but not applied by default
        - Attribute in job ticket for transform (rotations/translates/scales)
            - 3MF has transforms embedded in (embedded job ticket/ transform for geometry)
    - Material definitions can be in file or in job ticket
        - Named materials for 3MF and PDF
    - What about JT2Go (Siemens)?
        - http://www.plm.automation.siemens.com/en_us/products/teamcenter/plm-platform-capabilities/visualization/jt2go/
        - Different workflow, proprietary, widely used in automotive in Germany
        - Links to information being posted to 3d-printing@pwg.org list.
6. IPP 3D Printing Extensions
    - http://ftp.pwg.org/pub/pwg/ipp/wd/wd-ipp3d10-20160201-rev.pdf
    - Subunits:
        - Apply reservoirs to filament, or model filament supply as a subunit, or generalize?
            - or Marker supplies?
        - Lamps: limit to what is critical for printing, and not include illumination?
        - Motors: different from what we've done in the past, not modeled separately in 2D printers
            - Maybe associate with subunits that use them (extruder, build platform, etc.)
        - Waste tanks - type of supply
    - Section 4.3:
        - Drop figure 2
        - Focus on saying the ODL coordinate system is all the client cares about and the printer is responsible for converting to the printer's coordinate system.
    - How to print two objects side-by-side?
        - Either provide transforms in ODL space for each file or an attribute specifying that the printer can print both objects as it sees fit
    - Section 5.1.1.11: material-type
        - Make "type2 keyword | name", talk about localization/portability issues of localized unicode names vs. using vendor keywords with strings files.
        - "pla-steel-filament" should be "pla-steel"
        - Drop suffixes ("_filament", etc)
    - Section 5.1.7:
        - print-speed: specific to extruder, talk about FDM-specific
    - Mike Scrutton general comment: Have a lot of low-level, printer specific job template attributes (layer thickness, print-speed, etc.) that are not strictly intent

        - How much can be made generic - print-quality, tolerances, smoothness, etc.
        - Maybe focus on what can be objectively measured, and avoid anything that is device/process specific
        - Thickness - want strength, weight, or opacity, etc.
        - Can we define attributes characterizing these things?
        - Or do we retain these as optional, and provide higher-level attributes that describe the desired properties and not the exact device properties
        - "Print for speed", "Print-for-strength", "print for opacity", "print for smoothness/quality"
        - Extend "print-content-optimize" attribute with "speed", "strength", "weight", "opacity", "quality", and others.
        - printer-bed-temperature to "print-content-optimize" = 'adhesion'?
        - Come up with a list of properties - solid, least amount of cleanup, etc. that characterize why expert users fiddle with the slicer controls.
    - Stopped in Section 5
    - Resume discussion of print intent and updating Job Template attributes to match focus on intent.
7. IPP Job Password Repertoire
    - Fix section reference with funny S
    - Drop Infrastructure stuff from security considerations
    - Prepare registration templates
    - Review in IPP WG concall
8. Plethora of Proposals
    - Status Values for Input Trays
        - Consensus is to map 'media-needed' to 17 (Unavailable and OnRequest + Critical Alerts)
        - Add normative text to printer-state-reasons in 2911bis and the MFDALERTS update
        - Ira notes there are errors in the Top25 file - will update this and re-publish on pwg.org
    - New Media Names
        - Check whether 'iso_' prefix can have inch sizes
        - Maybe use 'na_' prefix for Arch E2/E3 sizes
        - Maybe use 'jis_' prefi for JIS K 7523 sizes (need to check if they can be inches)
        - Action: Mike will prepare a registration template for Canon media sizes and post to the IPP WG list
    - New "trimming-type" Keyword Value
        - No objections
        - Action: Mike to post registration template for trimming-type='draw-line'
    - Eco Staple
        - Add stitching-type (type2 keyword | name) initial values 'auto', 'wire', and 'crimp'

        - stitching-type-supported
        - Default is printer-defined for both finishings and finishings-col
        - finishings-col-database/ready can include stitching-type to know default (and allow the default to be configured)
        - Tentatively for IPP Finishings 2.0 errata update
        - Talk about printer doing best effort, reporting actual in finishings-col-actual, can't crimp or staple 500 page report...
        - Also look at JDF for staple type/shape
    - Engineering Z Fold
        - Consensus: Add enum and finishing-template keyword value 'fold-engineering'
        - Action: Mike to post registration template for 'fold-engineering'
    - Media Orientation
        - Consensus: Add orientation-requested member attribute
        - Action: Mike to post registration template for orientation-requested in finishings-col
    - Origin, Shape, and Size of Punch Holes
        - Consensus: Adopt as proposed, make lower bound of diameter 1 PWG unit
    - Origin, Size, and Angle of Staples
        - Consensus: Adopt as proposed, make lower bound of size 1 PWG unit
    - "finishings-col-database"
        - Consensus: Adopt language as proposed
    - IPP Finishings 2.0
        - Develop a Finishings 2.1 Errata update
        - Smith has volunteered to be editor
        - Target for PWG Last Call spanning August meeting
9. Next Steps
    - Discuss transform next F2F
    - Q: What about UI for higher-end hardware?
        - Chicken-and-egg problem so UIs haven't been developed
        - IPP Everywhere Client certification might be a way to verify that a client supports all required things

Next Steps / Open Actions

- Action: Mike to post updated RFC2911bis
- Action: Mike will prepare a registration template for Canon media sizes and post to the IPP WG list
- Action: Mike to post registration template for trimming-type='draw-line'
- Action: Mike to post registration template for 'fold-engineering'
- Action: Mike to post registration template for orientation-requested in finishings-col
- Review active specs, Canon media size and trimming proposals, HP Finishings errata, and Job Password Repertoire white paper at the F2F

- Next IPP meeting at the face-to-face on February 10, 2016 at 1pm PT and February 11, 2016 at 9am PT
- Next IPP conference calls February 22, 2016 at 4pm ET (3D) and February 29, 2016 at 3pm ET
- Action: Mike to fix *-k-octets in IANA IPP registry - should be Status attributes (PENDING - do this with the Job Password Repertoire registrations)