The Printer Working Group

Semantic Model Workgroup

Wednesday, Aug 12, 2015

Camas, WA

Daniel Manchala (Xerox)

Introduction

- The current Semantic Model workgroup is the latest in a series of PWG workgroups documenting and maintaining the Hard Copy Imaging System model.

- This model defines the semantic elements that constitute the imaging services and subunits of a network connected Imaging System, and the actions that operate on the objects and elements of the model, independent of a specific protocol or network environment.

- The Semantic Model is represented in an XML Schema form, and has been described by PWG Candidate Standards
  - Semantic Model (2003-2004) Modeled the Print Service, based on IPP 1.1 and other printing standards (SM1)
  - MFD (2007-2012) Seven standards adding other Hard Copy Imaging Services to expand the model to multifunction imaging –MFDs (SM2)
  - SM3 (2013-) Intended to consolidate and advance the model.

Introduction (continued)

- In establishing the Semantic Model and MFD workgroups, there were extensive discussions of purpose and objectives which formed the basis of a charter, and formal charter approval by the PWG.

- Specification development in these workgroups followed the PWG Standards Development Process document requirement of generating a Statement of Requirements. This document was to provide a clear, common understanding of the goals, a guide for developing the standard, and reference to measure the completeness of the resulting specification. The Statement of Requirements required formal PWG approval.

- For various reasons that seemed valid at the time, these procedures were largely short-circuited for SM3.
- The result is that the members of the workgroup do not have:
  - A clear, common understanding of the goals,
  - Guide for developing the several identified standards,
  - A reference to consider the completeness of the resulting specifications.
- The SM3 workgroup has not been able to make headway with its primary projects. Active participation in the workgroup has dropped. Significantly, there appears no clear consensus on the purpose of the workgroup itself.
- The objective of this face-to-face meeting is to consider where we are, and to decide what we want to do and how to do it.

Officers and Editors

- Chair:
  - Daniel Manchala (Xerox)
- Vice-Chair:
  - Paul Tykodi (TCS)
- Secretary: (none)
- Document Editors:
  - Nancy Chen – CWMP Printer Data Model (inactive)
  - Daniel Manchala (Xerox) – SM3 (unstarted), SM3 Schema
  - Ira McDonald (High North) – JDFMAP (awaiting prototype), CWMP Printer Data Model (inactive)
  - Paul Tykodi (TCS) – SM3 (unstarted)
  - Bill Wagner (TIC) – SM3 (unstarted)
  - Rick Yardumian (Canon) – JDFMAP (awaiting prototype)
  - Jeremy Leber (Lexmark) – SM3 (unstarted)

SM Meeting Agenda

9:00-9:15	Administrivia and Introduction
9:15-9:30	Status of Current Projects
9:30-10:30	Role of the SM Workgroup
10:30-10:45	Break
10:45-11:45	Consideration of SM Projects
11:45-12:00	Next Steps

Current Semantic Model Projects

- Maintenance and Update of the XML Schema Representation of Model and WSDL Representation of Operations
  - Description:
    - Incorporation and update of the Schema as new aspects of the Imaging Services model are approved as a result of work done in the Semantic Model WG, in other PWG workgroups and possibly in other organizations.
    - Correction of reported content or format errors in the Schema
    - Maintaining both a downloadable version and a web browse-able version of the schema so it can be viewed without special tools.
  - Status:
    - Version 2.903 (2.904?)has had some corrections and updates but is not fully up to date with respect to new aspects
    - Browse-able versions are still v1.85
  - Comment: This is a continuing and time-consuming effort for the editor, but also demands effort from the workgroup to be aware of and evaluate changes in Imaging that should be reflected in the model.

Current Semantic Model Projects
(from current SC approved charter)

- **Semantic Model v3.0 Part 1: Imaging System (IS3)**
  - Description: update the PWG MFD Model and Common Semantics specification [PWG 5108.01-2011], extending the model from that of an MFD to a more generalized Imaging System, including the Transform Service
  - Status: An outline has been created and revised (ftp://ftp.pwg.org/pub/pwg/sm3/wd/wd-sm3-specifications-outline-20141105.pdf), but no text exists.
  - Comment: Some drafts exist of earlier attempts at an SM3 specification that could be used as a starting point, although these do not necessarily follow the outline.

- **Semantic Model v3.0 Part 2: Jobs & Documents (JD3)**
  - Description: expand the scope of the PWG Print Job Ticket specification to encompass all of the SM Schema modeled imaging services supporting job ticketing elements.
  - Status: Same as IS3
  - Comment: Consolidation of information in MFD and Print Job Ticket.

- **Mapping CIP4 JDF to PWG Print Job Ticket v1.0 (JDFMAP)**
  - Description: define a normative mapping from XML objects and attributes in the CIP4 Job Definition Format [CIP4JDF] to XML elements in the PWG Print Job Ticket and Associated Capabilities [PWG5108.7]
  - Status: The editors believe that they have a technically complete Prototype draft of JDFMAP.
  - The SC could decide to fund an open source prototype (e.g., JTAPI from the Open Printing project could be adapted to implement this mapping).
  - Comment: This work was done within the SM WG with significant contributions by Rainer Prosi of CIP4.
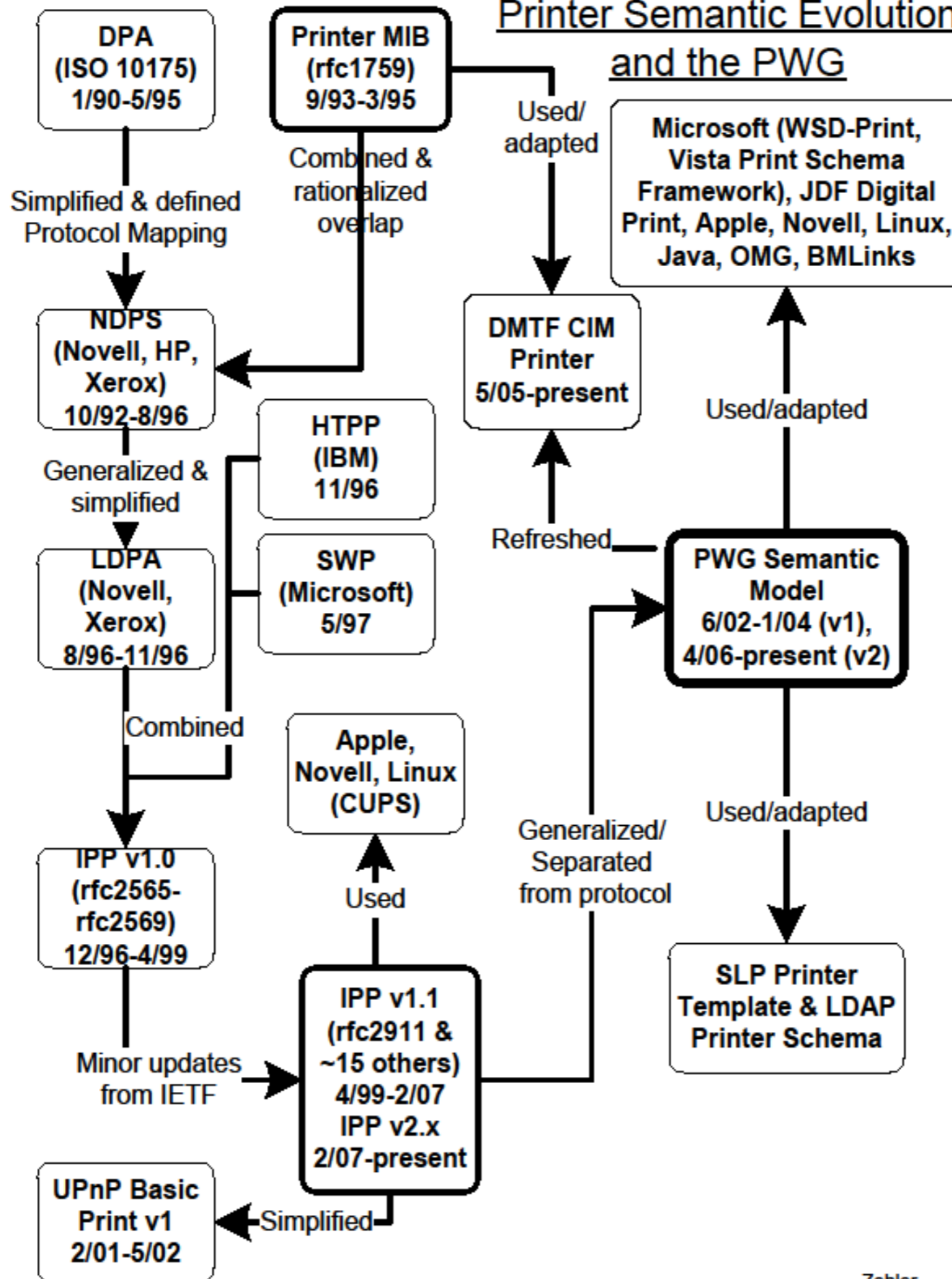
- **The Semantic Model Workgroup has undergone several incarnations, but has been considered a "permanent" PWG Workgroup charged with maintaining the PWG Imaging Systems Model.**

- **The original charter (2002) stated:**

  - One of the barriers to the use of the PWG print model is its tight association with the IPP protocol. In the definition of IPP, we clearly separated the model from the protocol. RFC2911 covers the base semantics. We also have extensions to the model defined in some Internet Drafts and IEEE-ISTO PWG standards. I believe we should split the IPP semantic model from the IPP protocol. Using the "PWG Semantic Model" in discussions around industry wide agreed upon print semantics avoids the "IPP baggage". I believe the separation will foster reuse in various network printing environments and standards. The separation will not affect compatibility with IPP.

Printer Semantic Evolution and the PWG

DPA (ISO 10175) 1/90-5/95

↓ *Simplified & defined Protocol Mapping*

Printer MIB (rfc1759) 9/93-3/95

Combined & rationalized overlap

NDPS (Novell, HP, Xerox) 10/92-8/96

↓ *Generalized & simplified*

HTPP (IBM) 11/96

SWP (Microsoft) 5/97

LDPA (Novell, Xerox) 8/96-11/96

Combined

IPP v1.0 (rfc2565-rfc2569) 12/96-4/99

Minor updates from IETF

Apple, Novell, Linux (CUPS)

Used

IPP v1.1 (rfc2911 & ~15 others) 4/99-2/07 IPP v2.x 2/07-present

Simplified

UPnP Basic Print v1 2/01-5/02

Used/adapted

Microsoft (WSD-Print, Vista Print Schema Framework), JDF Digital Print, Apple, Novell, Linux, Java, OMG, BMLinks

DMTF CIM Printer 5/05-present

Used/adapted

Refreshed

PWG Semantic Model 6/02-1/04 (v1), 4/06-present (v2)

Generalized/ Separated from protocol

Used/adapted

SLP Printer Template & LDAP Printer Schema

Zehler

- **There have been many changes in networked Hardcopy Imaging over the past 15 years.**
  - Addressed Imaging Services include not just printing but also scanning and other services.
  - The scope of the model has increased to include modeling the subunits, with more administrative and maintenance aspects.
  - Security considerations have become increasingly important, going beyond protocol and impacting basic semantic elements.
  - The environment from which Imaging Services are called has changed drastically, with users being mobile. This has given rise to remotely accessed and cloud based imaging systems.
  - User distinction between hardcopy imaging and other services has been blurred, with other services offering access to imaging and imaging services offering things beyond just image rendering.

- **A broader role of the Semantic Model:**

  - The workgroup was to maintain and keep up-to-date a protocol binding agnostic representation of the semantics that were agreed to within the various working groups. The SM is to represent the semantics as currently defined by the PWG.

  - The PWG should take the lead in defining enterprise and cloud extensions to the PWG model, including notification. It is the responsibility of the SM workgroup to reflect these in the Model Schema. This includes the work being done in the PWG, but also work being done in Mopria, WFA, and Google. These efforts should be coordinated.

  - Finally, the value of the Semantic Model is semantic alignment across the various protocols and the industry. The PWG is the primary standards organization dedicated to networked imaging services and should be concerned with this alignment. The Semantic Model workgroup is responsible for maintaining model.

- **… in addition to a generalized view of IPP:**

  - IPP is the only bindings that is so far used or is likely to be used for the PWG Imaging Model.

  - IPP has become increasingly expansive, covering light production as well as general printing, including device configuration and maintenance capability, notification, and with Infra, extending to Cloud Imaging.

  - By PWG process, no specification can be approved as a candidate standard unless there is notice of prototype. Prototyping in IPP is the only likely method so far.

  - Can we add to the SM without being prototyped in IPP?

  - Should SM WG only provide more than a high level (or generalized) view of IPP to allow for mapping between other job ticket and protocol bindings?

Role of the Semantic Model Workgroup (5)

- Agreement on the role of the Semantic Model workgroup (and, closely rated, the role of the Printer Working Group) is necessary to consider the nature and depth of the projects that the workgroup undertakes.

- Understanding of the role and agreement with its objectives is necessary for participants to justify spending time and effort on the projects.

- Consensus on the role, backed up with active participation on the part of the membership is necessary if the products of the workgroup are to be completed, useful and used.

- A meaningful charter statement defining the role must be developed and agreed to by the PWG membership.

Consideration of Role and Break

- **How do we get consensus within the PWG as a whole on the current mission of the PWG.**

- **How do we get consensus on the role of the Semantic Model WG in addressing this mission?**

- **How to we get and maintain the degree of member participation necessary to satisfy this mission?**

- **What is the alternative?**

- **BREAK!**

Semantic Model WG Projects

- **Of the SM3 current projects in the current charter**
  - Mapping CIP4 JDF to PWG Print Job Ticket v1.0 (JDFMAP) is largely complete and is currently awaiting prototype. Suggest that it continue on the path to Candidate Standard.
  - Maintaining the Semantic Model Schema and WSDL is the most important function of the SM WG, but has not received the necessary attention in keeping abreast of other PWG activities. Indeed, it is not even listed as a project.
  - The SM3 Specs need to be re-thought and re-proposed.
  - The CWMP Printer Data Model has had much effort and should be kept on hold if the Broadband Forum members renew interest.
  - Other 'on hold' projects should be considered terminated.
  - 'Potential' projects may be proposed in the future, but need not be in the charter.

Semantic Model WG Charter

- **Note that what follows is a proposition, subject to discussion and revision. The proposition is:**
  - The Semantic Model Workgroup Charter be updated.
  - The role of the Semantic Model Workgroup and scope of work be considered, agreed to, and defined in the updated workgroup charter including maintenance of the Model.
  - This charter is subject to Formal Approval.
  - Once the role of the Semantic Model workgroup is established, specific specification projects can be proposed, following the process defined in ftp://ftp.pwg.org/pub/pwg/general/process/pwg-charter-policy.txt. SM3 specifications should probably be first.
  - The white paper generated for each proposed specification is subject to formal approval, thus adding them to the charter.

Project 1: Maintaining the Semantic Model Schema and WSDL

- Is this activity necessary? Is the model useful? What should it reflect (just IPP, a more universal view, features defined by other organizations impacting Imaging Systems)?

- As a primary activity, it should be identified as a project and should be staffed. It involved technical maintenance of the XML and web-browseable forms. Members must consider what is to be added to the model and in what way, and may require going back to the originators of new features to question or clarify items.

- Although it has been stated that only written specs can become standards, not XML schema, some mechanism should be identified to show that a model representation is definitive. This might not require prototyping.

- Should an alternate representation method be used? Resource Description Framework (**RDF**) has been suggested.

- A definition of the objectives, staffing and methods use by this project should be generated and voted on.

SM3 Specifications

- What is the purpose of the SM3 specifications? Are they necessary?

  - The set of 'SM2' specifications are incomplete, inconsistent and in some cases outdated. The SM3 specs were to address these problems, although not by a massive rewrite. Just how is unclear to at least some of the potential authors, outlines notwithstanding.

  - Some regarded the SM2 specs as an elaboration on and guide to the Schema. Others considered them as a high level but definitive modeling (oxymoron?) of the services, operations and objects. At what level should SM3 specs be?

- These basic questions should be resolved by the workgroup with the candidate editors submitting the "white paper" for PWG approval, according to the PWG Charter Policy (ftp://ftp.pwg.org/pub/pwg/general/process/pwg-charter-policy.txt)

- If the process cannot be successfully completed, the project does not formally exist.

Next Steps

- Develop a new charter– objective by the next F2F
  - Establish consensus on the Role of the Semantic Model WG.
  - Generate a Charter draft, defining the specific areas of Standardization to be addressed
  - Submit this Charter Draft to the PWG for formal vote.
- Set up maintenance of the Model as a project, with a defined process and staff.
- Initiate the process to include SM3 specification project(s) in the charter.
  - Decide of scope and purpose of specification(s)
  - Get editors
  - Develop white paper(s)
  - Submit white papers to the PWG for formal vote.

More Info/How to participate

➢ **We welcome more participation from member companies**

➢ **Much of the discussion of issues will be on the SM3 mail list. You must subscribe to the list to be able to post to the list. See http://www.pwg.org/mailman/listinfo/sm3 to subscribe.**

➢ **The group maintains a Web Page for Semantic Model that includes links to the latest documents, schema and a browse-able version of the schema at http://www.pwg.org/sm3**

➢ **Next conference call: August 24, 2015; 12:00 – 1:00 PDT / 3:00 – 4:00 PM EDT.**

Call-in toll-free number (US/Canada): 1-866-469-3239

Call-in toll number (US/Canada): 1-650-429-3300

Call-in toll number (US/Canada): 1-408-856-9570

https://ieee-isto.webex.com/ieee-isto

Appendix

Past Specifications

Approved Documents

Print Service: *Approved January 2004*

- PWG5105.1:
  PWG Semantic Model Specification Version 1.00
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm10-20040120-5105.1.pdf

Scan Service: *Approved April 2009*

- PWG5108.02-2009:
  Network Scan Service Semantic Model and Service Interface Version 1.0
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-scan10-20090410-5108.02.pdf

Resource Service: *Approved July 2009*

- PWG5108.03-2009:
  Network Resource Service Semantic Model and Service Interface Version 1.0
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-resource10-20090703-5108.03.pdf

MFD Common Semantics: *Approved April 2011*

- PWG5108.01-2011:
  MFD Model and Common Semantics Version 1.00
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-mfdmodel10-20110415-5108.1.pdf

Copy Service: *Approved June 2011*

- PWG5108.04-2011:
  Copy Service Semantic Model and Service Interface Version 1.00
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-copy10-20110610-5108.04.pdf

MFD Requirements: *Approved September 2010*

- Multifunction Device Service Model Requirements
- ftp://ftp.pwg.org/pub/pwg/informational/req-mfdreq10-20100901.pdf

FaxOut Service : *Approved August 2011*

- PWG 5108.05-2011:
  FaxOut Service Semantic Model and Service Interface Version 1.0
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-faxout10-20110809-5108.05.pdf

System Control Service: *Approved February 2012*

- PWG 5108.06-2011:
  System Object and System Control Service Semantics Version 1.0
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-system10-20120217-5108.06.pdf

Print Job Ticket: *Approved August 2012*

- PWG 5108.07-2012:
  PWG Print Job Ticket and Associated Capabilities Version 1.0
- ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-pjt10-20120813-5108.07.pdf