



The Printer Working Group

**Cloud Imaging Model Workgroup
Face-to-Face Meeting**

February 3, 2015

El Segundo, CA (hosted by Xerox)

Agenda



When	What
10:30 – 10:45	Introduction and Administrative Intellectual Property Policy Statement. Identify Minute Taker. Introduce Participants. Consider Agenda.
10:45 – 12:00	Wrap-up of Workgroup Project Status of Cloud Imaging Requirements and Model Specification. Solicitation of PWG Last Call Review Comments on http://ftp.pwg.org/pub/pwg/cloud/wd/wd-cloudimagingmodel10-20150122.pdf . Background and Intent of Cloud Imaging Model project. Differences and Suggestions to SM.



Officers and Contributors

- Chair: Ron Nevo (Samsung)
- Vice Chair: Bill Wagner (TIC)
- Secretary: Michael Sweet (Apple)
- Document Editors
 - Bill Wagner (TIC): Editor
 - Ron Nevo (Samsung): Editor

PWG Last Call Announcement (1 of 2)



- Formal PWG Last Call announcement was made for the Cloud Imaging Requirements and Model(CLOUDIMAGING) specification: <http://ftp.pwg.org/pub/pwg/cloud/wd/wd-cloudimagingmodel10-20150122.pdf>
- PWG Last Call for this specification is scheduled to last from 22 January to 23 February, with the comments received up to that time to be considered at the February 23 Cloud conference call. Resolution of all Last Call comments will follow the scheduled Last Call period or the satisfaction of response quorum requirements, whichever comes later.
- Apple has provided notice of IPP Shared Infrastructure Extensions prototype. This specification defines an IPP Binding of the Cloud Imaging Requirements and Model specification; the prototype of a model binding satisfies the prototype requirement for the specification of a general model.



PWG Last Call Announcement (2 of 2)

- The Cloud WG has completed extensive review of the various revisions of this model document and a workgroup last call.
- The PWG Last Call period includes this Face-to-Face meeting, a PWG Process requirement to allow specification questions and issues to be discussed among the PWG as a whole in real time. Comments can be made during this meeting or via the mail lists.
- The PWG Process requires that not less than 30% of the PWG membership comment on, participate in, or communicate that they have no comments relative to a given specification.
- Procedure for registering comments on this specification via the mail lists is given in <http://www.pwg.org/archives/pwg-announce/2015/003643.html>
- Because the IPP Shared Infrastructure Extensions specification and the Cloud Imaging Requirements and Model specification reference each other, they must be approved together. Although mutual compatibility was intended during development, it should also be considered during Last Call.



Background (1 of 3)

- PWG activity on Cloud Imaging started with a BOF at the February 2010 Plenary. BOFs addressed existing Cloud printing implementations, general considerations, requirements, and scenarios.
- Cloud Print Scenarios: User uses File, URL or Web App to send document to Cloud. Cloud may process document and:
 - Cloud sends to Printer
 - Printer pulls from Cloud, or
 - Cloud returns document to User, who then send to local printer.
- Cloud BOFs continued through 2010, with good participation and many volunteers. The workgroup was established by March 2011, with Andrew Mitchell (Hewlett Packard) and Ron Nevo (Samsung) as Co-Chairs and Michael Sweet as Secretary.



Background (2 of 3)

- March 2011 Charter stable draft defined five projects:
 - Cloud Model (Q4, 2011)
 - Cloud Printing IPP Binding (Q4, 2011)
 - Cloud Printing Soap Binding (Q1, 2012)
 - Cloud Multifunction IPP Binding
 - Cloud Multifunction Soap Binding
- By June 2011, Andrew withdrew. Although charter objectives remained the same, participation declined. It became apparent that the slated projects would take much longer than anticipated.
- Cloud printing implementations, particularly Google Cloud Print, were becoming more prevalent, although with approaches incompatible with the PWG Semantic Model. An interim project was defined to map the PPD and Microsoft Print Schema Specification formats used by Google Cloud Print for Printer Capabilities and Job Tickets to the Semantic Model Print Job Ticket. JDF was later added to the mapping.



Background (3 of 3)

- A clean definition of the PWG Print Job Ticket was generated by August 2011. Initial Drafts of the mapping document were posted by October, 2011 with updates continuing until October 2012 when it was decided that the mappings were of general interest, not just for Cloud. More mappings were added and the project was transferred to the Semantic Model Workgroup.
- By March of 2012, it was decided that the IPP Binding be transferred to the IPP WG. The SOAP binding was dropped. The Cloud Model project was split into Cloud Print and Cloud Multifunction models. The first Cloud Model draft was posted.
- Cloud Print Model draft updates continued until March 2013. The primary author withdrew and updates ceased.
- The Cloud Imaging (multifunction) Model was made the sole Cloud WG Project. The first draft of this specification was posted in April 2013. There have been about 30 revisions since then.



Intent

- The intent of the Cloud Imaging Model Working Group is to develop a model for providing Imaging Services via a Cloud Imaging System in a way consistent with the PWG Semantic Model.
- The current PWG Cloud Imaging Model contends that the operations interface between a User Client and a Cloud Imaging Service is no different than that between a User Client and any networked Imaging Service, with the exception of asynchronous notification capability (if any).
- However, Cloud Imaging Services often must interface with out-of-cloud end devices (e.g., printers, scanners) to which direct access is blocked by a firewall. The PWG Model identifies a Local Imaging System Proxy intermediate agent and defines a new set of operations from Proxy to Cloud Service.



Noteworthy Considerations (1 of 3)

- The Cloud Imaging Model does not seek to replace any standard client-cloud interface, but outlines an approach to accessing non-cloud based imaging system from a Cloud-based service. It is recognized that this access may be associated with any sort of functional application (e.g., an editor, search machine, photo app), not just a application to allow printing of a document. Therefore, aspects such as User identification, security, billing, etc. are not specifically addressed.
- Cloud Imaging may take various forms.
 - The interface from Client to Cloud Based service, which is sufficient for many forms of Cloud Imaging utilization, is defined as being the same as that defined in the Semantic Model for a Client to Networked Imaging Service interface. Both the Basic Client and the Management Client interfaces are summarized from a Cloud access perspective.
 - The interface among Cloud Imaging Services is assumed to follow the existing Semantic Model interface for fanout (although this should be better defined.)
 - The interface between a Cloud Imaging Service and a Local Imaging Service not directly accessible to the Cloud is the primary subject of the Cloud Imaging Requirements and Model specification..



Noteworthy Considerations (2 of 3)

- The Cloud Imaging Model is an expansion upon the PWG Semantic Model. Because of considerations in doing IPP bindings, there are changes to the Semantic Model V2 that are not yet addressed in SM3. Where necessary to consider the interface to a Cloud based Service (such as the Scan Service), these changes are described in the Cloud Imaging Model.
- The Model defines a new Actor call the Local Imaging System Proxy (Proxy for short) which is a Client-Client adapter allowing a Local Imaging System to register with and query the services in a Cloud Imaging System, to see if the Cloud Service has anything for a Local Service, and to provide state and status information about the Local Service to the Cloud Service
- The Proxy may be a separate device handling one or more Local Imaging Systems; it may be a software application running in a general purpose computer; it may be a functional or physical component in the device supporting a Local Imaging System. The interface between the Proxy and the Local Imaging System is not defined. However, the form and content of the Proxy to Cloud Imaging Service interface operations is compatible with PWG Semantic Model Client to Service operations, so that the Proxy could have a standard Client interface with the Local Services.



Noteworthy Considerations (3 of 3)

- The Model is intended to be very general, allowing for queuing and processing to be done in the Cloud Service, in the Proxy, and/or in the Local Service. Various levels of Fanout are possible, including at the Cloud Service, Proxy and/or Local Service levels
- In addition to defining operations and identifying the Semantic Model Elements to be communicated in these operations, the Model includes sequence diagrams illustrating representative transactions.
- An Informative (non-Normative) sequence diagram is provided showing a transaction including the Proxy to Local Service interaction with a standard Client to Imaging Service interface between the Proxy and the Local Service.
- An Informative (non-Normative) table is provided listing Elements to be communicated in Cloud Imaging transactions, correlating these Elements to PWG Semantic Model V2 elements, and identifying new Elements.
- In some instances, there was some confusion with the SM V2 Elements, which will prompt recommendations to the Semantic Model WG in addition to the request to add new Elements

Differences and Suggestions to SM WG (1 of 4)



- The current Operations Schema (V1-185) lists operations separately for each Service (e.g., CreatePrintJob, CreateScanJob, etc). The Cloud Model relies upon the fact that most operations are common to multiple Imaging Services and, because operations are directed to a specific Service, does not need to include the name of the Service in the operation (e.g., CreateJob).
- The current Operations Schema (V1-185) defines Cloud oriented operations just for the Print Service. These should be expanded to all services, perhaps via a general Imaging Service complex Element.
- There have been additions to and changes in the Operations Schema (V1-185) Cloud oriented Operations. These should be reflected in SM3.

Differences and Suggestions to SM WG (2 of 4)



- Charset usage in SM:
 - SM has CharsetConfigured and CharsetSupported Elements but no Charset Element
 - There should be a note in SM 3.0 that WSDL binding passes charset in XML header for requests and responses but other bindings (e.g. IPP) pass a charset Element inline
- Current 2.9xx schema still has old services (e.g., EmailIn, EmailOut) that will not be documented in SM3. How will these be handled?
 - Remove from schema?
 - Include as an informative extension to the base schema?
- SM has uses “State” element relying on position to indicate what it refers to.
 - More desirable to use prefix in Element name indicating Document, Job, Service or System State.

Differences and Suggestions to SM WG (3 of 4)



- The current Semantic Model tends to use the same Element name for Boolean Elements indicating whether a capability is supported (e.g., MediaCol, KOctets) and the multivalued or Complex element that appears in Job and Document Processing.
- The current Schema uses the Element Name "Id" to refer to the identification integer of various things (including Service). Terms should have prefix (e.g., ServiceId).
- The current Schema uses Id + ServiceType to uniquely identify a Service within a System. ServiceUuid is a preferable term.
- The current Schema includes a DeviceId element, which is the 1284 Device ID but is considered to identify a Service. It might better correlate to a System ID, although a SystemUuid should be added (as well a LocalSystemUuid)

Differences and Suggestions to SM WG (4 of 4)



- It is preferable to use the Element Name “Document” instead of ImagingDocument
- The original Add<service>HardcopyDocument operation required InputSource as a mandatory Element. AddHardcopyDocument is replaced by consideration of IPP FaxOut binding with AddDocumentImages, a more general operation. In this operation, InputSource is replaced by the more general InputElements (input-attributes in IPP) which is not mandatory IPP. The Add<service>HardcopyDocument to AddDocumentImages change should be made to the Semantic Model Operations. It should be considered as to whether InputElements is a mandatory Element.



Next Steps

- The Cloud Model specification needs to have sufficient comments to meet quorum requirements
- Comments will then be resolved and considered by the Cloud WG.
- An updated specification will then be put up for vote. Editorial comments issues during vote will be addressed.
- If the specification does not pass voting because of serious technical objections, these will be resolved.
- Barring a clear need to proceed with a new project, the Cloud Workgroup will then go into hiatus, with the mail list and the website being monitored for questions and issues.



Cloud Imaging WG Participation

- We welcome participation from all interested parties
- Cloud Imaging Working Group Web page
 - <http://www.pwg.org/cloud/index.html>
- Subscribe to the Cloud mailing list
 - <https://www.pwg.org/mailman/listinfo/cloud>
 - cloud@pwg.org
- Cloud Imaging WG holds bi-weekly phone conferences announced on the Cloud mailing list
 - Next conference call is February 23, 2015 at 3 pm EDT
 - Conference Calls on same weeks as SM3 conference calls.
 - Conferences on opposite weeks of IPP WG calls