

IPP Working Group Session

August 7, 2012

Redmond, WA

PWG F2F Meeting

IPP WG Meeting Agenda



Tuesday, August 7

1:30 - 1:35	Introductions, Minute Taker, Agenda Review
1:35 - 1:45	Current IPP WG status
1:45 - 2:00	Updated Results of IPP/2.0 Interoperability
2:00 - 3:30	PWG Media Standardized Names 2.0 (MSN2)
3:30 - 3:45	Break
3:45 - 4:45	IPP Everywhere
4:45 - 5:00	Next Steps

IPP WG Officers



- IPP WG Co-Chairs:
 - Paul Tykodi (TCS)
 - Ira McDonald (High North)
- IPP WG Secretary:
 - Michael Sweet (Apple)
- IPP WG Document Editors:
 - Ira McDonald (High North) – IPP Everywhere, IPP Scan Service, IPP over HTTPS Transport Binding and “ipps” URI Scheme, LDAP Schema for Printer Services
 - Michael Sweet (Apple) – IPP Everywhere, PWG Media Standardized Names 2.0, IPP over HTTPS Transport Binding and “ipps” URI Scheme, LDAP Schema for Printer Services, IPP FaxOut Service

IPP WG Status



- IPP Everywhere specs in development:
 - IPP Everywhere (PWG Last Call until August 24)
 - IETF IPP over HTTPS Transport Binding and "ipps" URI Scheme
 - IETF LDAP Schema for Printer Services (updates RFC 3712)
 - PWG Media Standardized Names 2.0 (MSN2)
- IPP Multifunction specs in development:
 - IPP Scan Service
 - IPP FaxOut Service
- IPP Cloud binding specs in development:
 - None (yet)

IPP WG Status



- Candidate Standards:
 - IPP: Job and Printer Extensions - Set 3 (JPS3)
 - PWG Raster Format
- Up-to-date pending IANA registrations online:
 - <http://www.pwg.org/ipp/ipp-registrations.xml>
 - Will maintain this in parallel for new specifications
 - Also have some MIB registrations pending

Document Editors Needed



- As we complete our work on IPP Everywhere, we need to identify editors for the IPP Multifunction specifications
- Need a new editor for IPP Scan Service since Andrew is no longer able to serve as editor
- Additional multifunction services need to be addressed: FaxIn, Copy, System Control, Transform
 - These should be relatively easy since they are essentially binding specs that reference the corresponding Semantic Model specs
 - See FaxOut for an example of how easy it will be
- IPP Multifunction spec will likely be an update of IPP Everywhere with pointers to the corresponding service specifications

IPP/2.0 Interoperability Event



- During the August 2011 F2F we decided the IPP/2.0 interoperability event will be virtual using the CUPS ipptool program and conformance test files
- February 2012 release of ipptool covers:
 - All required operations and attributes for IPP/2.0
 - Partial coverage of operations and attributes for IPP/2.1
 - Basic testing for existence of IPP/2.2 operations and attributes
- Final results for IPP/2.0 today!

Why We Do Interoperability Tests



- Part of the PWG Process that attempts to answer some key questions:
 - Are our specifications sufficient to implement and ship products (not just prototype)?
 - What are the common mistakes implementers make, and why?
 - How widely are certain features implemented?
 - How can we improve future IPP specifications and conformance?
- The PWG is not chartered to do certification for its standards
 - but operating system vendors typically already have certification programs in place
- Interoperability Testing is *Not* Certification
 - but it *can* be part of a vendor's self-testing/QA and third-party certification services

Final Results



- Mike tested 43 shipping printers from 10 vendors
 - 14 IPP/1.1 printers
 - 29 IPP/2.0 printers
 - Shown as letter (anonymous vendor) and printer number
- Omitted most of the higher-level print job tests from the results since none of the printers tested actually supported them ("SKIP")
- All printers completed the tests
- Summary:
 - Average score was 81% correct responses
 - Worst was 47%
 - Best was 97%

Final Results (con't)



- Common Problems:
 - Not validating request-id, order and type of attributes
 - Returning wrong status codes
 - Not reporting media-size-supported and other media-col Printer attributes
 - Not maintaining a job history
 - Supporting Create-Job but not Send-Document
 - These printers typically did support Send-URI
 - Reporting support for Create-Job and Send-Document but it didn't work
 - Supporting Print-URI/Send-URI but not "ftp" URIs
 - Reporting http: URIs for printer-uri-supported
 - Reporting duplicate Printer attributes

Final Results (con't)



Vendor	A				B		C		D														
	A1	A2	A3	A4	B5	C6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	
Printer/Test																							
IPP Version	2.0	2.0	2.0	2.0	2.0	2.0	1.1	1.1	1.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.1	2.0	
RFC 2911 section 3.1.1: Bad request-id value 0	P	P	P	P	P	P	F	F	F	P	P	P	P	P	P	P	P	P	P	P	F	P	
RFC 2911 section 3.1.4: No Operation Attributes	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: attributes-charset	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: attributes-natural-language	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: attributes-natural-language + attributes-cha	P	P	P	P	P	P	F	F	F	P	P	P	P	P	P	P	P	P	P	P	F	P	
RFC 2911 section 3.1.4: attributes-charset + attributes-natural-lang	P	P	P	P	P	P	F	F	F	P	P	P	P	P	P	P	P	P	P	P	F	P	
RFC 2911 section 3.1.8: Unsupported IPP version 0.0	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.2: No printer-uri operation attribute	P	P	P	P	P	P	F	F	F	P	P	P	P	P	P	P	P	P	P	P	F	P	
RFC 2911 section 3.2.1: Print-Job Operation	F	F	F	P	P	P	P	P	P	F	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.2.3: Validate-Job Operation	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.2.5: Get-Printer-Attributes Operation (default)	P	P	P	P	P	P	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
RFC 2911 section 3.2.5: Get-Printer-Attributes Operation (requested-	P	P	P	P	P	P	P	P	F	P	P	P	P	P	P	P	P	P	P	P	F	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (default)	P	P	P	P	P	P	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (requested-attributes)	F	F	F	F	P	P	S	S	S	P	F	F	F	F	F	F	F	F	F	P	S	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (my-jobs)	P	P	P	P	P	P	S	S	S	P	F	F	F	F	P	F	F	P	P	P	S	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (my-jobs different user)	P	P	P	P	P	P	S	S	S	P	P	P	P	P	P	P	P	P	P	P	S	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (which-jobs=not-completed	P	P	P	P	P	P	S	S	S	P	F	F	F	P	F	F	P	P	P	S	P		
Get-Job-Attributes Until Job Complete	F	F	F	F	P	P	F	F	F	F	F	P	P	P	P	S	P	F	P	P	F	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (which-jobs=completed)	P	P	P	F	P	P	F	F	P	P	F	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (which-jobs, requested-at	F	F	F	F	P	P	S	S	S	P	F	P	P	P	F	F	P	F	F	F	S	P	
RFC 2911 section 3.3.3: Cancel-Job Operation (completed job)	P	P	P	F	P	P	P	P	P	P	F	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.3.3: Cancel-Job Operation (pending/processing job	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.3.4: Get-Job-Attributes Operation	F	F	F	F	P	P	F	F	F	P	F	P	P	P	P	P	P	P	P	P	F	P	
RFC 2911 section 3.2.2: Print-URI Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Print-URI with bad URI: Print-URI Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.2.4: Create-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.3.1: Send-Document Operation	S	S	S	S	S	S	S	S	S	S	P	S	S	S	S	S	S	S	S	S	S	S	
Send-Document missing last-document: Create-Job Operation	S	S	S	S	S	S	S	S	S	F	S	S	S	S	S	S	S	S	S	S	S	S	
Send-Document missing last-document: Send-Document Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.3.3: Cancel-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.3.2: Send-URI Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-URI with bad URI: Create-Job Operation	S	S	S	S	S	S	S	S	S	F	S	S	S	P	P	S	S	P	P	S	S	S	
Send-URI with bad URI: Send-URI Operation (bad URI)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-URI with bad URI: Cancel-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	F	F	S	S	F	F	F	S	S	
Print-Job with copies	F	F	F	P	P	P	S	S	S	S	S	S	S	P	P	P	P	P	P	P	S	S	
PWG 5100.12 section 6.2 - Required Printer Description Attributes	F	F	F	F	F	F				F	F	F	F	F	F	F	F	F	F	F	F	F	
Total Passes	18	18	18	18	24	24	9	9	10	20	17	19	19	19	23	19	20	22	23	23	10	22	
Total Failures	7	7	7	7	1	1	9	9	8	5	10	5	5	5	4	7	5	3	4	4	8	2	
Total Skips	11	11	11	11	11	11	17	17	17	11	9	12	12	12	9	10	11	11	9	9	17	12	
Scores	81%	81%	81%	81%	97%	97%	74%	74%	77%	86%	72%	86%	86%	86%	89%	81%	86%	92%	89%	89%	77%	94%	

PASS

FAIL

SKIP

Final Results (con't)



Vendor	D								E					F		G	H		I		J	AVG
	D23	D24	D25	D26	D27	D28	D29	D30	E31	E32	E33	E34	E35	F36	F37	G38	H39	H40	I41	I42	J43	
Printer/Test	1.1	2.0	2.0	2.0	2.0	2.0	2.0	1.1	1.1	2.0	2.0	1.1	2.0	2.0	1.1	2.0	1.1	1.1	1.1	1.1	1.1	
IPP Version	F	F	P	P	P	P	F	F	F	P	P	F	P	P	P	P	F	F	F	F	F	
RFC 2911 section 3.1.1: Bad request-id value 0	P	P	P	P	P	P	P	P	F	P	P	F	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: No Operation Attributes	P	P	P	P	P	P	P	P	F	P	P	F	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: attributes-charset	P	P	P	P	P	P	P	P	F	P	P	F	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: attributes-natural-language	P	P	P	P	P	P	P	P	F	P	P	F	P	P	P	P	P	P	P	P	P	
RFC 2911 section 3.1.4: attributes-natural-language + attributes-cha	F	F	P	P	P	P	F	F	F	P	P	F	P	P	P	P	F	F	F	F	P	
RFC 2911 section 3.1.4: attributes-charset + attributes-natural-lang	F	P	P	P	P	P	P	F	F	P	P	F	P	P	F	P	F	F	F	F	P	
RFC 2911 section 3.1.8: Unsupported IPP version 0.0	F	F	P	P	P	P	F	P	P	P	P	P	P	P	F	P	P	P	P	P	F	
RFC 2911 section 3.2: No printer-uri operation attribute	F	F	P	P	P	P	F	F	F	P	P	F	P	P	P	P	F	F	F	F	F	
RFC 2911 section 3.2.1: Print-Job Operation	F	F	P	P	P	P	F	F	F	P	P	F	P	P	F	P	P	P	P	F	F	
RFC 2911 section 3.2.3: Validate-Job Operation	P	F	P	P	P	P	P	P	P	P	P	P	P	P	F	P	P	P	P	P	F	
RFC 2911 section 3.2.5: Get-Printer-Attributes Operation (default)	F	F	F	F	F	F	P	F	F	F	P	F	F	F	F	P	F	F	F	F	F	
RFC 2911 section 3.2.5: Get-Printer-Attributes Operation (requested-	P	F	P	P	P	P	P	P	P	P	P	P	P	P	F	P	F	F	P	P	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (default)	P	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	F	P	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (requested-attributes)	F	F	F	P	P	P	F	S	P	P	P	P	P	P	F	P	F	F	S	F	F	
RFC 2911 section 3.2.6: Get-Jobs Operation (my-jobs)	P	F	F	P	P	F	P	S	P	P	P	P	P	P	F	P	P	P	S	P	F	
RFC 2911 section 3.2.6: Get-Jobs Operation (my-jobs different user)	P	F	P	P	P	P	P	S	P	P	P	P	P	P	P	P	P	P	S	P	P	
RFC 2911 section 3.2.6: Get-Jobs Operation (which-jobs=not-completed	P	F	F	P	P	P	P	S	P	P	P	P	P	P	F	P	P	P	S	P	F	
Get-Job-Attributes Until Job Complete	F	S	P	P	P	P	F	F	P	F	F	P	P	F	S	F	P	P	F	F	S	
RFC 2911 section 3.2.6: Get-Jobs Operation (which-jobs=completed)	F	F	P	P	P	P	F	P	P	F	F	P	P	P	P	P	P	P	F	F	F	
RFC 2911 section 3.2.6: Get-Jobs Operation (which-jobs, requested-at	F	F	P	P	P	P	F	S	P	F	F	P	P	P	F	P	P	P	S	F	F	
RFC 2911 section 3.3.3: Cancel-Job Operation (completed job)	F	F	P	P	P	P	F	P	P	F	F	P	P	P	P	P	P	P	P	F	F	
RFC 2911 section 3.3.3: Cancel-Job Operation (pending/processing job	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	F	
RFC 2911 section 3.3.4: Get-Job-Attributes Operation	F	F	P	P	P	P	F	F	F	P	P	F	P	P	F	P	F	F	F	F	F	
RFC 2911 section 3.2.2: Print-URI Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Print-URI with bad URI: Print-URI Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.2.4: Create-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.3.1: Send-Document Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-Document missing last-document: Create-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-Document missing last-document: Send-Document Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.3.3: Cancel-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
RFC 2911 section 3.3.2: Send-URI Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-URI with bad URI: Create-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-URI with bad URI: Send-URI Operation (bad URI)	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Send-URI with bad URI: Cancel-Job Operation	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	
Print-Job with copies	S	S	S	S	S	S	S	S	F	P	P	F	P	P	S	P	S	S	S	S	S	
PWG 5100.12 section 6.2 - Required Printer Description Attributes	F	F	F	F	F	F	F			F	F		F	F	F							
Total Passes	10	4	19	22	22	21	12	10	13	19	20	13	23	22	11	23	16	15	9	11	8	
Total Failures	13	19	5	2	2	3	12	8	11	6	5	11	2	3	11	2	7	8	9	12	7	
Total Skips	12	13	12	12	12	12	12	17	11	11	11	11	11	11	13	11	12	12	17	12	13	
Scores	63%	47%	86%	94%	94%	92%	67%	77%	69%	83%	86%	69%	94%	92%	69%	94%	80%	77%	74%	66%	60%	

PASS

FAIL

SKIP

Future IPP Interoperability Events



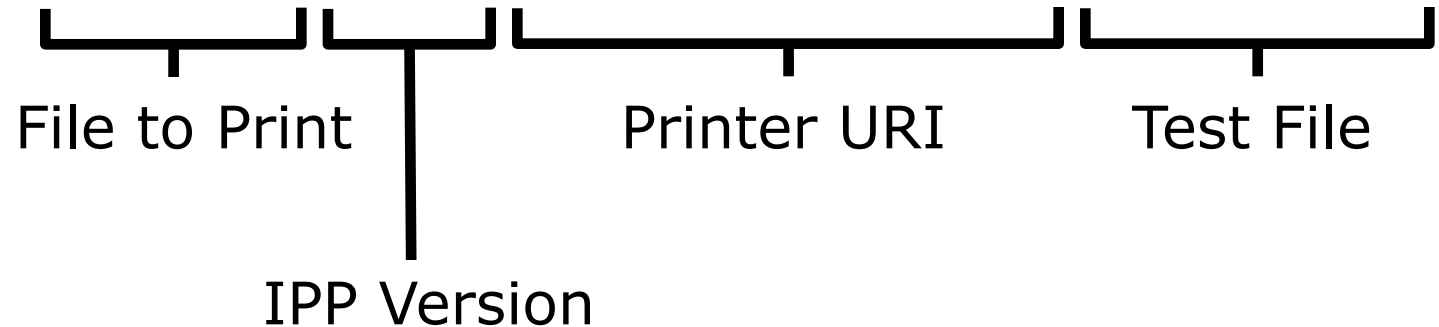
- Still want to test interoperability of new and existing IPP specifications
 - Same virtual format with ipptool test files
 - Particularly important for IPP Everywhere
 - Eventually would like to have coverage of all PWG and IETF extensions
 - Challenge will be to test the tests and get results for some of the higher-level extensions - not all extensions have a reference implementation or wide adoption...
- Future ipptool updates will include:
 - Tests for undefined attribute and group tags
 - Additions to IPP/2.1 and IPP/2.2 tests
 - Tests for new and existing specifications as needed

Where to Get CUPS ipptool

- <http://www.cups.org/software.php>
- Binaries available for Linux, Mac OS X, and Windows
- See the file “IPPTOOL.txt” for instructions on running the conformance tests
- Additional documentation in man-ipptool.html and man-ipptoolfile.html

How to Use ipptool

```
ipptool -Itf file.ext -V 2.x ipp://address/path ipp-2.x.test
```



Example for IPP/2.0 printer with PDF support:

```
ipptool -Itf testfile.pdf -V 2.0 ipp://192.168.0.1/ipp \  
ipp-2.0.test | tee make-model-2.0-results.log
```

PWG Media Standardized Names 2.0 (MSN2)



- Current (prototype) draft:
 - <ftp://ftp.pwg.org/pub/pwg/ipp/wd/wd-pwgmsn20-20120725-rev.pdf>
- Proposed Schedule:
 - WG Last Call during September 2012
 - Stable draft and PWG Last Call to span October 2012 F2F
 - PWG Formal Vote starting in November 2012

IPP Everywhere



- Current (stable) draft at:
 - <ftp://ftp.pwg.org/pub/pwg/ipp/wd/wd-ippeve10-20120724-rev.pdf>
 - PWG Last Call until August 24, 2012
- Minor changes from WG Last Call:
 - Clarification of roll-fed and manual-feed reporting and examples
 - Addition of PWG Raster figures for different feed orientations
- Proposed Schedule:
 - PWG Formal Vote starting in September 2012

IPP WG Next Steps



- IPP Everywhere
 - Last Call and Formal Vote Q3 2012
 - Virtual interoperability event for IPP Everywhere starting in Q4 2012
- IPP Multifunction
 - Interim working drafts of IPP Scan Service and IPP FaxOut Service in Q3/Q4 2012
 - Initial working drafts of other specifications starting in Q3/Q4 2012
- IPP Shared Infrastructure Extensions starting in Q4 2012?

IPP WG Info / Participation



- We welcome participation from all interested parties
- IPP Working Group web page
 - <http://www.pwg.org/ipp/index.html>
- IPP Working Group wiki
 - <http://pwg-wiki.wikispaces.com/IPP>
- Subscribe to the IPP mailing list
 - <http://www.pwg.org/mailhelp.html>
- IPP WG holds bi-weekly phone conferences announced on the IPP mailing list
 - Next conference call is August 20, 2012 at 3pm (EST)