Topics

- Why IPP Everywhere?
- Discovery Protocols
- Document Formats
- IPP Extensions
- Next steps
Why IPP Everywhere?
Reason #1: Printer Drivers

Google search results:

“Windows Printer Driver Files”
- about 19,700,000

“Mac OS X Printer Driver Files”
- about 10,100,000

“Linux Printer Driver Files”
- about 2,340,000
Printer Drivers

• The single largest software component of Windows and Mac OS X
  • Lines of code AND installed size
• Often little code-sharing between drivers or platforms
• CUPS-based operating systems can use the same driver code BUT architectures vary widely
• Hard to support and distribute for more than a few platforms
  • New operating systems coming out DAILY for very interesting consumer and computing devices
  • New devices do not follow the old use model
Reason #2: Standards

“The nice thing about standards is that there are so many of them to choose from.”

- Andrew S. Tenenbaum
Multiple “Standards”

• Every printer vendor has (re)invented their own “standard” discovery protocols, print protocols, and page description languages

• No other peripheral industry works this way (anymore):
  • Mass storage: 1 standard per interface (SCSI, IEEE1394, ATA, SATA, USB, etc.)
  • Keyboards and mice: 1 standard per interface (PS/2, USB)
  • Cameras: 1 standard per interface (IEEE1394, USB)
Reason #3: User Experience

Google search results:

“Printing does not work”
- about 298,000,000

“Printing works”
- about 30,700,000
User Experience

• Many users have a poor printing experience
• Difficult setup (particularly for network printing)
• Printer and printer driver often do not cater to the user
  • Technical jargon and knowledge are often required
  • Confusing options, different for every vendor
• Software provided in the box is usually out-of-date, requiring a large download from the vendor’s web site
How Can We Help?

“Simplicity is the ultimate sophistication.”

- Leonardo DaVinci

“Three Rules of Work: Out of clutter find simplicity; From discord find harmony; In the middle of difficulty lies opportunity.”

- Albert Einstein
Define a Single Standard

• One standard that brings together all of the pieces needed for network printing
  • We should also think about scanning

• Some pieces may be interface-dependent:
  • Discovery
  • Transport

• Others may depend on the printer:
  • File formats
Define a Single Standard

- The end result should allow printers to work as easily as any other peripheral with today’s computing devices WITHOUT printer-specific software from the printer vendor

“Driverless Printing”
Discovery Protocols
Discovery Protocols

- DNS-SD, Multicast DNS, and Zero-Configuration Networking
  - Apple’s “Bonjour” protocol suite
- LDAP
- SLP
- SNMP
- UPnP
- WS-Discovery
Document Formats
Document Formats

• Vector formats
  • Typically for higher-cost printers with large amounts of memory and often mass storage capabilities
  • Harder to support in printers, usually easy to produce from clients

• Raster formats
  • Typically for lower-cost printers with small amounts of memory
  • Easy to support in printers, usually easy to produce from clients

• Printer cost issues probably require support for a raster format
  • The vector format can be optional
Vector Formats

• Existing formats
  • PDF
    • ISO 19005 aka PDF/a
    • ISO 32000 aka PDF 1.7
    • PWG 5102.3 aka PDF/is
  • PCL 6 aka PCL XL
  • PostScript
  • (Open)XPS

• Requirements
  • Streamable from client
  • Multi-page
  • Flexible color space and depth
  • Device-independent
Raster Formats

- Existing Formats
  - CUPS Raster (v2)
  - JPEG (JFIF, JBIG2, EXIF)
  - JPEG 2000
  - PNG/MNG
  - TIFF

- Requirements
  - Low overhead/cost on client and printer
  - Streamable on both client and printer
  - Multi-page
  - Flexible color space and depth
  - Device-independent
IPP Extensions
IPP Extensions

• Expose 1284 device ID: “printer-device-id (text)"
• Expose Printer MIB OIDs as IPP attributes such as CUPS Marker Attributes
• Provide icon(s) representing the printer in standard format (PNG): "printer-icons (1setOf uri)"
• Color: rendering intent for out-of-gamut colors
• "output-mode (type2 keyword)" to pick between color and monochrome
IPP Extensions

• Additional finishings enums for roll-fed printers: trim-after-pages, trim-after-documents, trim-after-job

• Additional media-col member attributes:
  • media-bottom-margin (integer), media-left-margin (integer), media-right-margin (integer), media-top-margin (integer) to provide document margins (printer can choose proper mode to satisfy)
  • media-source (type3 keyword) to specify the input source/tray
  • Also media-*-supported first-class attributes to list supported values
IPP Extensions

- PWG 5100.6: Page Overrides
- PWG 5100.X: Job and Printer Operations Set 2 (for media-col-database)
Next Steps
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• Announce draft charter and provide this document to PWG membership for a formal vote
  • Requires responses from at least 25% (7) of the PWG membership
  • Need 66% YES votes if there are no strong objections, 80% otherwise

• Draft charter defines two documents:
  • IPP Everywhere requirements
  • IPP Everywhere specification

• Out of scope:
  • No new discovery protocols
  • No new management protocols
  • No new transport protocols
Guidelines

- Not supporting every feature and capability of a printer with the standard is OK
  - Print quality
  - User experience
  - Support for all kinds of printers
- Limit the number of optional items
  - Improves interoperability and consistency
  - Will make the standard simpler
- Support wireless clients and printers
Guidelines

• As much as possible, base our work on existing standards
  • DNS-SD/Multicast DNS for network discovery
  • IPP/2.0 and HTTP/1.1 for network transport
  • PDF and CUPS Raster (or some variant) for formats

• Provide easy extension support for extra features and capabilities
  • Allow vendors to work WITH the standard instead of around it!
Documents

- Wiki:

- Draft charter for IPP Everywhere:

- This document:
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