

IPP Everywhere BOF

10 February 2010

Scottsdale, AZ - PWG F2F Meeting

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- Software provided in the box is usually out-of-date, requiring a large download from the vendor's web site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

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“Driverless Printing”

(Preliminary) 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

(Preliminary) Guidelines



- As much as possible, base our work on existing standards
 - IPP/2.0 and HTTP/1.1 for network transport
 - Everything else to be discussed today
- Provide easy extension support for extra features and capabilities
 - Allow vendors to work WITH the standard instead of around it!

Discovery Protocols

Discovery Protocols



- DNS-SD, Multicast DNS, and Zero-Configuration Networking
 - Apple's "Bonjour" protocol suite
- LDAP
- SLP
- SNMP
- UPnP
- WS-Discovery
- Others?

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 computers
- Raster formats
 - Typically for lower-cost printers with small amounts of memory
 - Easy to support in printers, usually easy to produce from computers
- 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
 - Media size, type, source, and margins often go together, but should these be first-class attributes?
 - 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)
- Others?

Next Steps
