Topics

• Talking about two Printer Applications and the Printer Application Framework today:
  • ippeveprinter (as extended in the ippsample/ippeveselfcert projects)
  • LPrint
  • PAPPL
• Each has a slightly different focus and capabilities
• All have a common heritage (CUPS)
• Also want to say a few things about iOS®/macOS® compatibility
Printer Applications Are...

- A replacement for CUPS printer drivers
  - Options are replaced by IPP attributes
  - Driver-specific UI is provided by the Printer Application

- An implementation of an IPP Everywhere™ Printer
  - Basic IPP Everywhere support only requires PWG Raster, plus JPEG for color printers
  - CUPS library and sample code provide an easy-to-use framework for implementations

- Compatible with CUPS 1.4 and later
  - Can be compatible with iOS® 5 and later with a few small additions (DNS-SD subtype and "image/urf" document format)
  - macOS 10.8® and later support IPP Everywhere™ via the command-line, can be used from the GUI with the same changes needed for iOS support
ippeveprinter

- Started life as "ippserver" in the CUPS "test" directory
- Renamed to "ippeveprinter" for CUPS 2.3 with 3 modes:
  - Basic "legacy" mode emulating simple laser/inkjet printers from ippserver
  - PPD-based PostScript printer mode for supporting legacy PostScript printers
  - Attribute file mode for development and testing
- Uses CUPS backends to communicate with printers
- Manages a single printer, no background/daemon mode
ippeveprinter Enhancements

• Development continues in the IPP workgroup's ippsample and ippeveselfcert projects
  • [https://github.com/istopwg/ippsample](https://github.com/istopwg/ippsample) / [https://github.com/istopwg/ippeveselfcert](https://github.com/istopwg/ippeveselfcert)
  • Will be providing pull requests to Apple to incorporate these changes back into CUPS

• Enhancements:
  • Support for resource files (currently just a single strings file) for localizable attributes/values
  • Use system sounds for Identify-Printer (macOS only for now)
  • Support for Cancel-My-Jobs
  • Support for finishings-col attributes
  • New "clone-printer" script that collects attributes, icon, and strings file from an IPP printer
LPrint

- Supports a variety of common label and receipt printers connected via network or USB
  - [https://www.msweet.org/lprint](https://www.msweet.org/lprint)
- Developed "on a dare"
- Based loosely on the CUPS ippeveprinter source code
  - Multiple printer support via limited subset of IPP System Service
  - Background daemon (run on demand) handles all spooling and communication
  - Does not use CUPS backends
- Supports standalone operation/spooling without CUPS as well as running as an IPP Everywhere™ printer on the network that all CUPS clients can access
- Supports printing “raw”, Apple/PWG Raster, and/or PNG files
PAPPL: Printer Application Framework

• Web site:
  • https://www.msweet.org/pappl

• A simple C-based framework/library for developing Printer Applications
  • Specifically developed to support the next major version of LPrint and a Gutenprint Printer Application
  • Sufficiently general purpose to support any kind of printer or driver that can be used on desktops, servers, and in embedded environments

• Supports JPEG, PNG, PWG Raster, Apple Raster, and "raw" printing to printers connected via USB and network (AppSocket/JetDirect) connections.

• Licensed under the Apache License Version 2.0 with an exception to allow linking against GPL2/LGPL2 software
PAPPL Demo
macOS®/iOS® Compatibility

• Printer Applications can support macOS and iOS clients fairly easily:
  • Support IPP Everywhere™
  • Support the Apple Raster format ("image/urf" MIME media type, handled by the CUPS raster API)
  • Advertise the "_universal" DNS-SD sub-type in addition to the "_print" sub-type
  • Implement the CUPS "marker-xxx" attributes so that macOS clients are able to show supply levels
  • Implement the "media-col-ready" and "media-ready" attributes so that iOS clients are able to select media
  • PAPPL handles all of this for the Printer Application...
Resources (1/2)

- ippeveprinter
  - https://istopwg.github.io/ippsample
  - https://github.com/istopwg/ippsample
  - https://github.com/istopwg/ippeveselfcert
  - https://github.com/apple/cups (original CUPS source)

- LPrint
  - https://www.msweet.org/lprint
  - https://github.com/michaelrsweet/lprint

- PAPPL
  - https://www.msweet.org/pappl
  - https://github.com/michaelrsweet/pappl
Resources (2/2)

- IPP Everywhere™ v1.0 specifications:

- IPP Everywhere™ v1.1 specifications (in PWG Call for Objections):

- IPP Everywhere™ printer self-certification tools:
  - https://istopwg.github.io/ippeveselfcert