CUPS Plenary

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Topics

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- Developer "Cheats" and Recommendations
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Introduction

- CUPS is the standards-based, open source printing system developed by Apple Inc. for macOS® and other UNIX®-like operating systems.
- CUPS 2.2.x is the current stable branch
  - Plan is to continue 2.2.x updates over the next year
- CUPS web site, source code, and bug database are hosted on Github

CUPS 2.2 Release History

- CUPS 2.2.0 released September 13, 2016
  - IPP Everywhere: local print queues, finishings
- CUPS 2.2.1 released October 3, 2016
- CUPS 2.2.2 released January 17, 2017
- CUPS 2.2.3 released March 28, 2017
  - All general bug fixes

CUPS Developer “Cheats”

- #define _CUPS_NO_DEPRECATED 1
  - Turns off compatibility defines/typedefs for enums
  - Marks deprecated functions and types as unavailable so you get a compile error instead of a warning
- #define _IPP_PRIVATE_STRUCTURES 1
  - Makes ipp_t structure public for existing source code
  - Not a long-term solution - use public API instead

CUPS Developer Recommendations

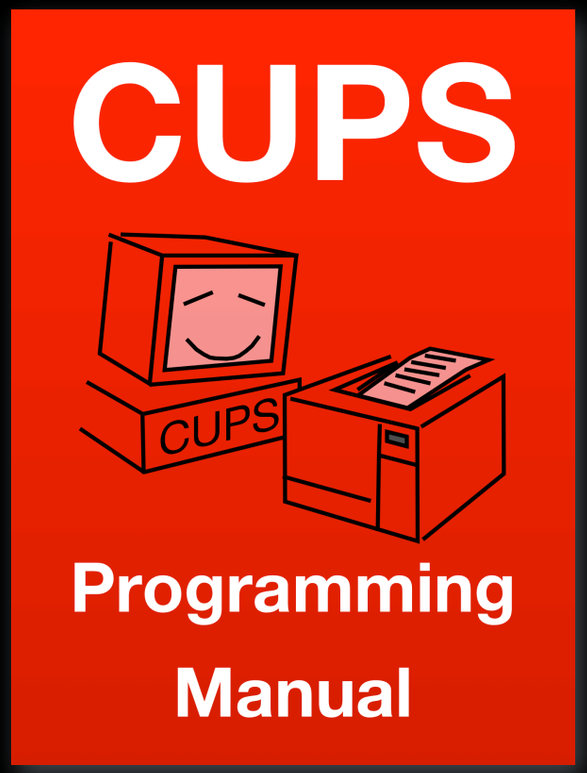
- Use the cupsEnumDests API to build a list of available printers
  - cupsGetDests only reports "static" or "hard wired" print queues, which forces admins to use things like cups-browsed to add a queue for every printer, negatively affecting system performance

CUPS Developer Recommendations

- Use the cupsDest* APIs to get supported print options and submit print jobs
  - Supports things like "ready media" and changes to installable options
  - Automatically creates "local" (temporary) print queues as needed (uses existing queues, too)

CUPS Developer Recommendations

- Updated documentation with examples that only use recommended APIs can be found on the CUPS web site:
  - https://www.cups.org/doc/cupspm.epub
  - https://www.cups.org/doc/cupspm.html
- Please stop using PPDs and the old CUPS APIs in applications and frameworks!



ippsample Project

- One of the PWG's Github projects:
  - https://github.com/istopwg/ippsample
  - https://istopwg.github.io/ippsample
- Sample implementations of IPP Client, Printer (server), and Proxy
  - Experimental code
- Based on CUPS code base with same license (LGPL2)

ippsample Project

- Printer and Proxy implementations support transforms:
  - PDF and JPEG to PWG Raster and HP PCL
  - 3MF and STL to G-code (tested with Ultimaker 2/2+)
- Plan is to also prototype System service

ippsample Programs

- ippfind - general purpose "find" program for printers (as found in CUPS)
- ippproxy - implementation of IPP Proxy for generic HP PCL and IPP Everywhere printers
- ippserver - implementation of IPP Printer/Infrastructure Printer

ippsample Programs

- ipptool - general purpose program for sending requests an doing tests (as found in CUPS)
- ipptransform - transform tool to PWG Raster and HP PCL
- ipptransform3d - transform tool to G-code

ippserver

- Enhanced version of the sample code included with CUPS
- Supports previous "single queue" mode like the original sample code, plus a new configuration directory mode that allows for the configuration of multiple queues (IPP Printers) and other settings
- Supports notifications
- Supports transforms using external programs, e.g., ipptransform and ipptransform3d

ippserver

- Supports both regular ("direct printing") and Infrastructure Printer ("Cloud printing") modes
- Supports localization (".strings") files, icons, and other resource files
- Supports supply levels
- Supports ready media/finishings

ipptransform

- Uses CoreGraphics (macOS) or MuPDF (all) to rasterize files
  - Configurable memory limits (banded output)
- Supports sRGB, sGray, and Black color spaces
- Supports "copies", "media", "media-col", "page-ranges", "print-color-mode", "print-quality", "print-scaling", "printer-resolution", and "sides" Job Template attributes

ipptransform3d

- Uses Cura to slice files
  - Configurable options (output device, etc.)
- Supports STL and 3MF files
- Supports "materials-col" (up to two materials), "platform-temperature", "print-accuracy", "print-base", "print-quality", and "print-supports" Job Template attributes
- Maps print-quality to Cura "quick print" base settings

CUPS Future

CUPS Future

- Continue development of ippsample code
  - launchd/systemd integration
  - Additional auth mechanisms (MutualAuth, OAuth, etc.)
  - System Service implementation, local queues?
  - Release printing proxy
- User commands (lp, lpr, etc.)?

CUPS Future

- Additional discovery/directory service support
  - Bring back LDAP support, this time using the standard schema
  - DNS-SD/mDNS enhancements being discussed in the IETF
    - https://tools.ietf.org/wg/dnssd/
  - Configuration profiles

Resources

- CUPS Web Site
  - https://www.cups.org/
- CUPS Repository
  - https://github.com/apple/cups
- IPP Sample Code Repository
  - https://github.com/istopwg/ippsample

Q&A