

CUPS Plenary

Joint PWG / Open Printing Summit - May 2022
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Open Printing
making printing just work



Before We Begin...

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 - TL;DR: Anything you say in a PWG meeting or email to a PWG address can be used in a PWG standard
 - (but please do read the IP policy above if you haven't done so)

Topics

- Introduction
- CUPS 2.4.x
- CUPS 2.5
- Deprecations
- Future Stuff
- Resources

Introduction

- CUPS is the standards-based, open source printing system developed by OpenPrinting for Linux® and other Unix®-like operating systems. CUPS uses IPP Everywhere™ to support printing to local and network printers
- CUPS is provided under the Apache License v2.0 with an exception that allows linking to GPL2-only software (like Gutenprint)
- The CUPS web site, source code, and bug database are hosted on Github
 - <https://openprinting.github.io/cups>
 - <https://github.com/openprinting/cups/>

CUPS 2.4.x

CUPS 2.4.x

- Release manager: Zdenek Dohnal
- Release history:
 - CUPS 2.4.0 - November 29, 2021
 - CUPS 2.4.1 - January 27, 2022
- Release schedule:
 - CUPS 2.4.2 - Soon
 - CUPS 2.4.3 - July/August 2022
 - CUPS 2.4.4 - September/October 2022
 - CUPS 2.4.5 - November/December 2022

CUPS 2.5

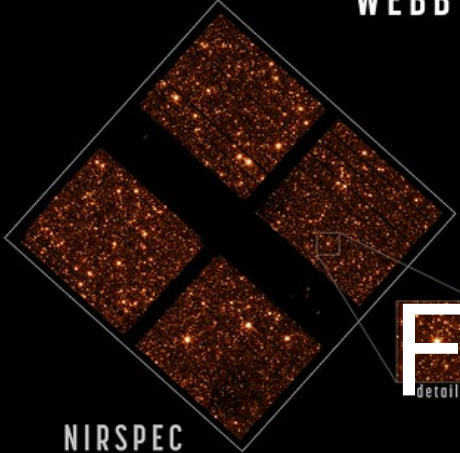
CUPS 2.5 - Next Feature Release

- Release manager: Till Kamppeter
- Release schedule:
 - CUPS 2.5b1 - November/December 2022?
 - CUPS 2.5rc1 - January/February 2023?
 - CUPS 2.5.0 - February/March 2023?
- Features:
 - Discovery improvements: "wide-area" DNS-SD lookups and configuration profiles
 - Localization improvements: multiple languages in IPP Everywhere PPDs, centralize localization efforts
 - OAuth 2.0/OpenID authentication: default callback
 - "job-sheets-col" and better "media-col" attribute support
 - X.509 certificate management improvements

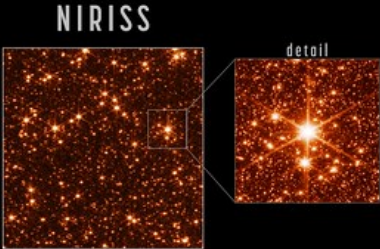
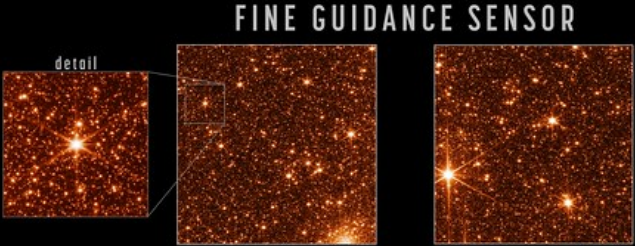
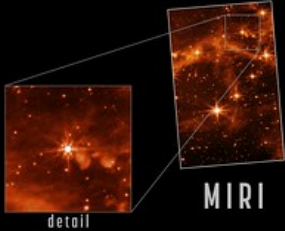
CUPS 2.5 - OAuth 2.0/OpenID

- Replacement for Kerberos SSO
 - Doesn't require root access or user changing gymnastics like Kerberos
- Many open source solutions available, including my own:
 - <https://www.msweet.org/moauth>
- SAML and Webauthn authentication backends are commonly available, too
- Support OpenID/RFC 8414 compliant OAuth 2.0 authorization servers
 - Authorization server is reported via IPP "oauth-authorization-server-uri (uri)" attribute
- Bearer and refresh tokens will be cached per-user/auth-server
- Authorization UI will be presented using embedded web view - only available when printing from system console
 - Command-line tool for registering bearer token, too

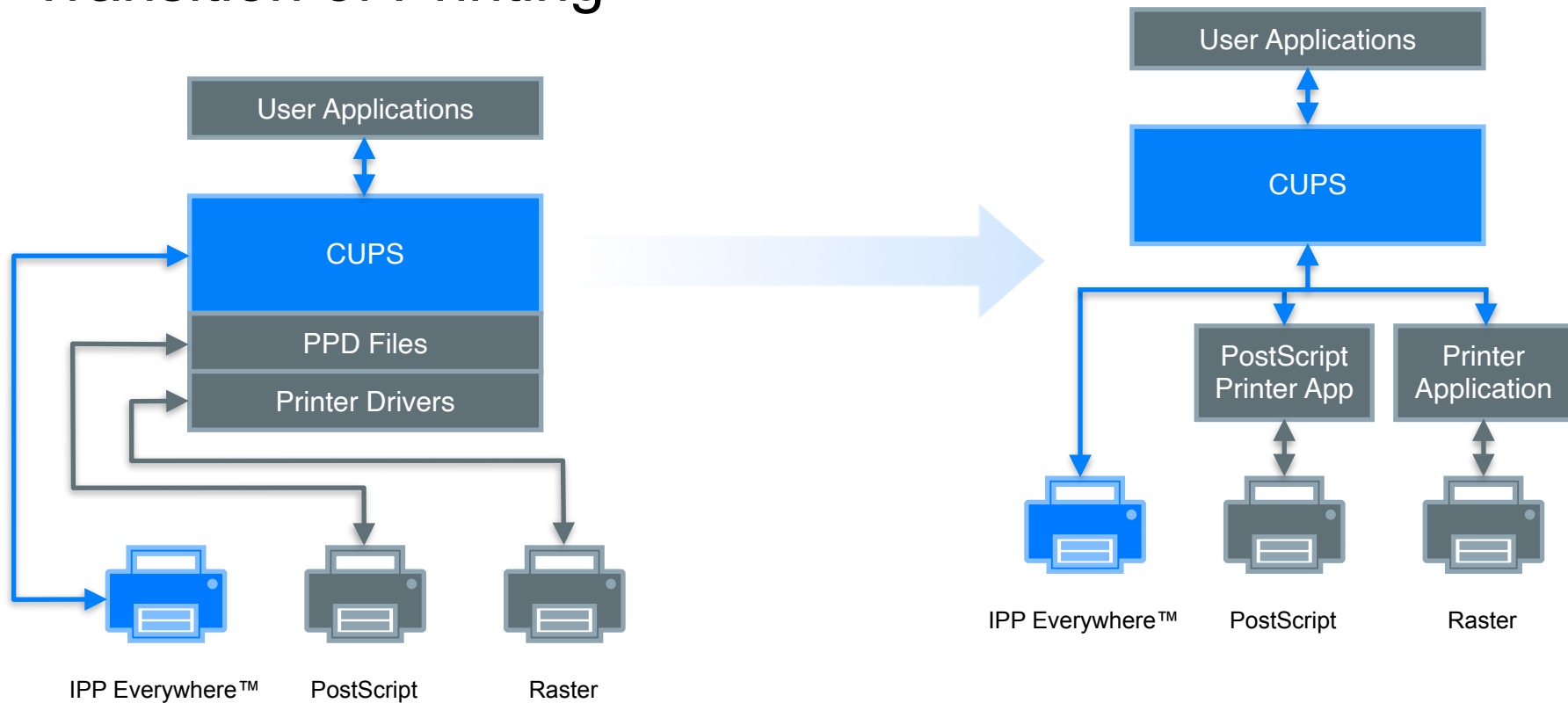
WEBB TELESCOPE IMAGE SHARPNESS CHECK



Future Stuff



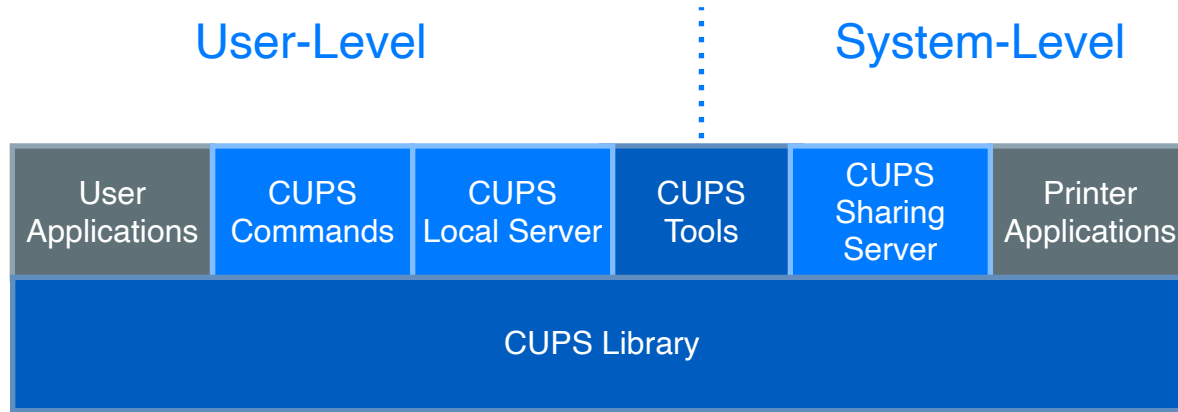
Transition of Printing



CUPS 3.0 - Modular Printing Architecture

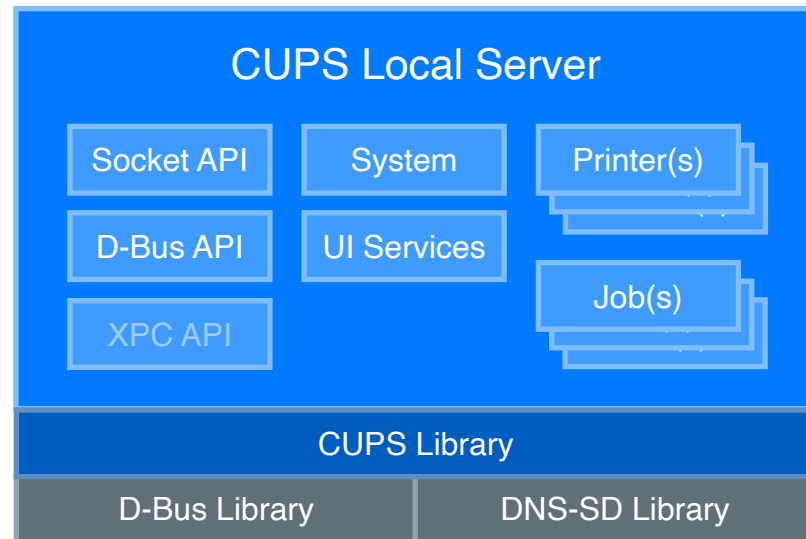
- Commands: lp, lpr, lpstat, cancel, etc.
- Local Server
 - Handles local print requests for desktop/mobile devices
 - Only temporary IPP Everywhere print queues
 - Runs as user
 - UNIX domain socket and/or D-Bus API and/or XPC API
- Sharing Server
 - Handles network print requests and local printing on headless servers
 - Full print accounting/ACLs/pre-processing of documents
 - OAuth 2 and PAM-based authentication/authorization
 - IPP Shared Infrastructure Extensions/System support
- Tools
 - ippeveprinter, ippfind, ipptool, ipptransform
- Library: libcups

CUPS 3.0 - Overview



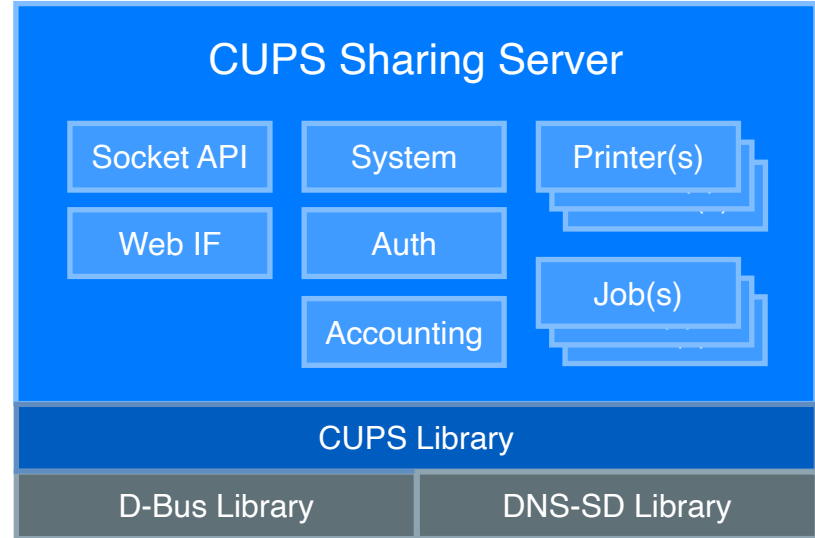
CUPS 3.0 - Local Server

- Handles all discovery and communications with printers
- Handles authentication, authorization, consent, and notification UI
- Converts to/from PDF/raster as needed for printers
- Job history is limited to the current session/login
- No web interface
- Configuration limited to listing specific printers or servers that cannot be discovered via DNS-SD ("profiles")



CUPS 3.0 - Sharing Server

- Handles all communications with printers
- Authorization/consent/notification UI needs to be handled by client
- Converts to/from PDF/raster as needed for printers
- Job history is configurable
- Web interface
- Configuration similar to existing cupsd
- OAuth token introspection (RFC 7662) and scopes for ACLs



CUPS 3.0 - Challenges

- Much broader scope and integration than the original CUPS work
- Desktop support - need to uplift GNOME/KDE/XFCE desktops to new D-Bus API for printing, authorization, consent UI
- Need developers to work on the local and sharing servers, desktop UI/ services
 - Can probably use/adapt PAPPL code for the core server bits
 - Much of the print dialog work can be repurposed
 - Probably have existing authorization/notification UI we can use
- Graphics libraries - current PDF tools/libraries have problematic licenses or other limitations

CUPS 3.0 - Progress

- Commands and Local Server (pending cups-local project)
- Sharing Server (pending cups-sharing project)
- Tools and Library (libcups project)
 - <https://github.com/michaelsweet/libcups>
 - *To be moved to OpenPrinting "soon"*
 - Deprecated APIs have been removed
 - Naming and calling conventions have been normalized
 - *See "MIGRATING.md" document*
 - New shared library major version
 - *Not binary compatible with CUPS 2.x and earlier*
 - Still have to implement D-Bus API and bring over ippttransform

Resources

- CUPS Web Site
 - <https://openprinting.github.io/cups>
- CUPS Repository
 - <https://github.com/OpenPrinting/cups>
- CUPS Programming Manual
 - <https://openprinting.github.io/cups/doc/cupspm.html>
 - <https://openprinting.github.io/cups/doc/cupspm.epub>