

CUPS Plenary

Joint PWG / Open Printing Summit - May 2024
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Open Printing
making printing just work



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 - (but please do read the IP policy above if you haven't done so)
- *This meeting is being recorded*

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 schedule:
 - CUPS 2.4.0 - November 29, 2021
 - CUPS 2.4.1 - January 27, 2022
 - CUPS 2.4.2 - May 26, 2022
 - CUPS 2.4.3 - June 1, 2023
 - CUPS 2.4.4 - June 6, 2023
 - CUPS 2.4.5 - June 13, 2023
 - CUPS 2.4.6 - June 22, 2023
 - CUPS 2.4.7 - September 20, 2023
 - CUPS 2.4.8 - "Soon"

CUPS 2.5

CUPS 2.5 - Next Feature Release

- Release manager: Till Kamppeter
- Release schedule:
 - CUPS 2.5b1 - June/July 2024?
 - CUPS 2.5rc1 - July/August 2024?
 - CUPS 2.5.0 - August/September 2024?
- Features:
 - DONE: Discovery improvements: "wide-area" DNS-SD lookups and configuration profiles
 - DONE: Localization improvements: multiple languages in IPP Everywhere PPDs, centralize localization efforts
 - DONE: X.509 certificate management improvements
 - DONE: Back-porting of other CUPS 3.0 APIs as appropriate
 - OAuth 2.0/OpenID authentication: default callback
 - "job-sheets-col" support

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
 - Will conform to IPP OAuth Extensions v1.0
- 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

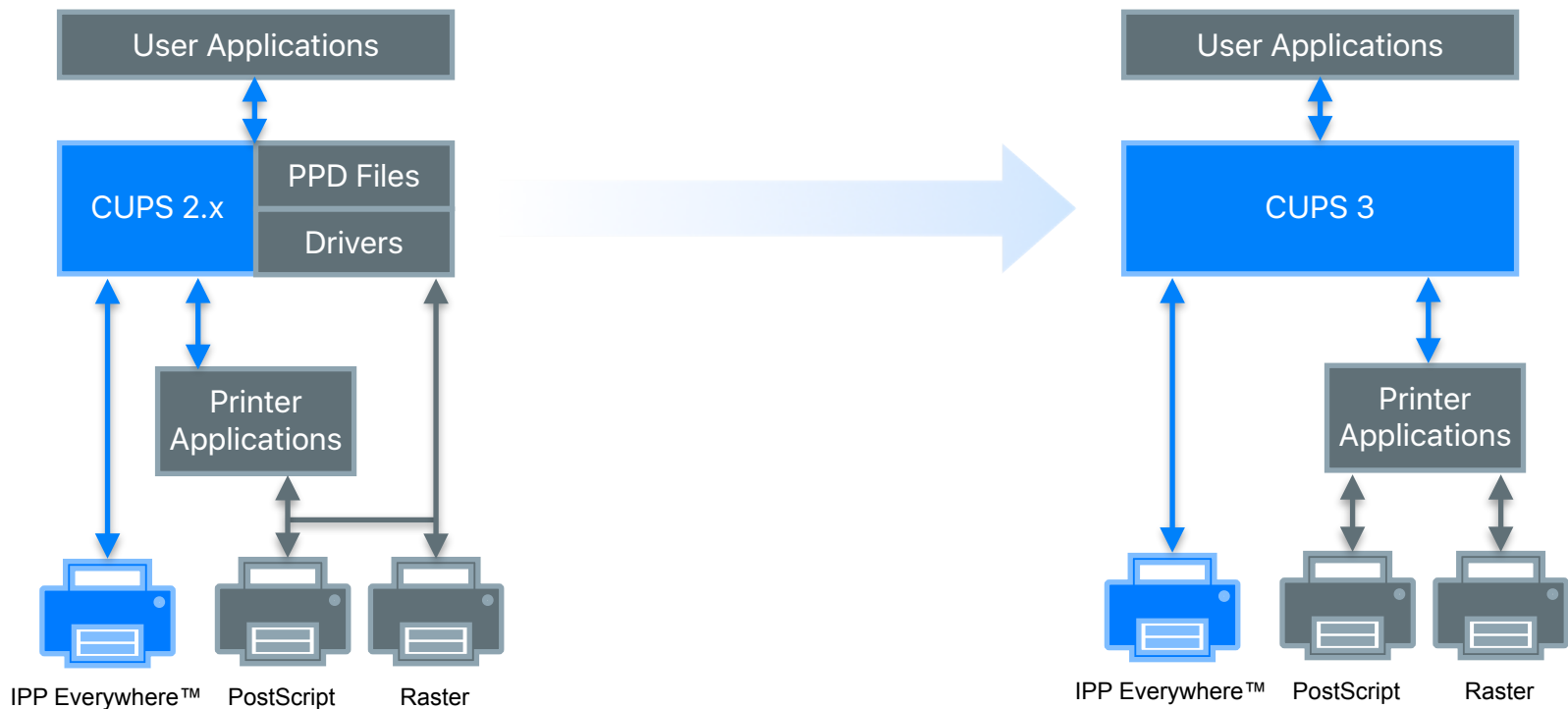


Future Stuff

CUPS 3.0 - Future Feature Release

- Release manager: Michael Sweet
- Release schedule:
 - libcups 3.0b1 - February 9, 2023
 - libcups 3.0b2 - October 5, 2023
 - libcups 3.0rc1 - May/June 2024
 - cups-local 3.0b1 - May/June 2024
 - libcups 3.0.0 - August/September 2024
 - cups-local 3.0b2 - August/September 2024
 - cups-sharing 3.0b1 - August/September 2024
 - cups-local 3.0rc1 - November/December 2024
 - cups-sharing 3.0b2 - November/December 2024
 - cups-local 3.0.0 - February/March 2025
 - cups-sharing 3.0rc1 - February/March 2025
 - cups-sharing 3.0.0 - April/May 2026

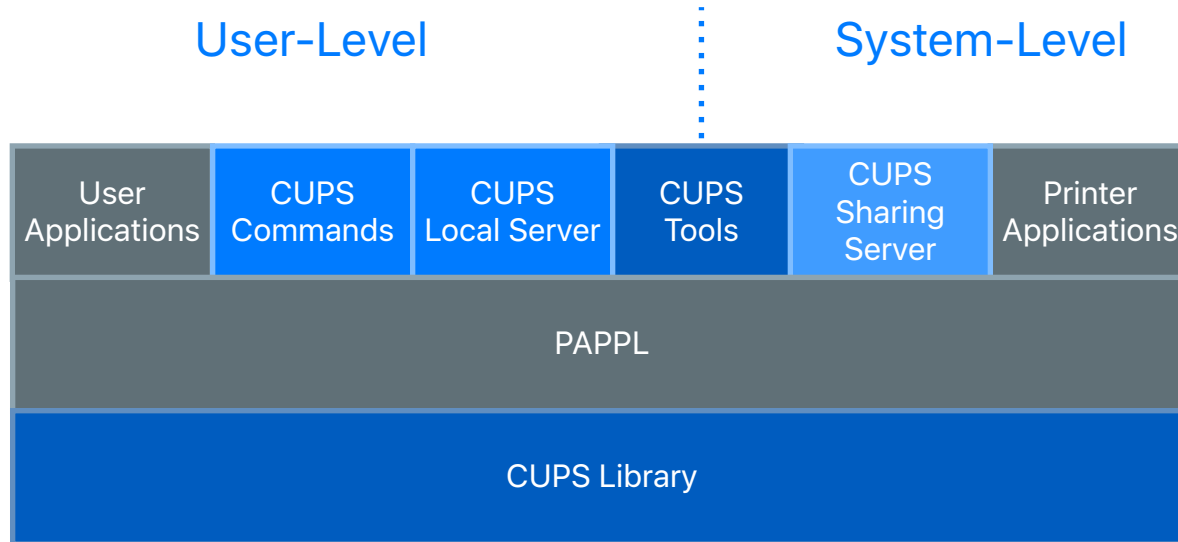
Transition of Printing



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 w/D-Bus API to get per-user socket path
- 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

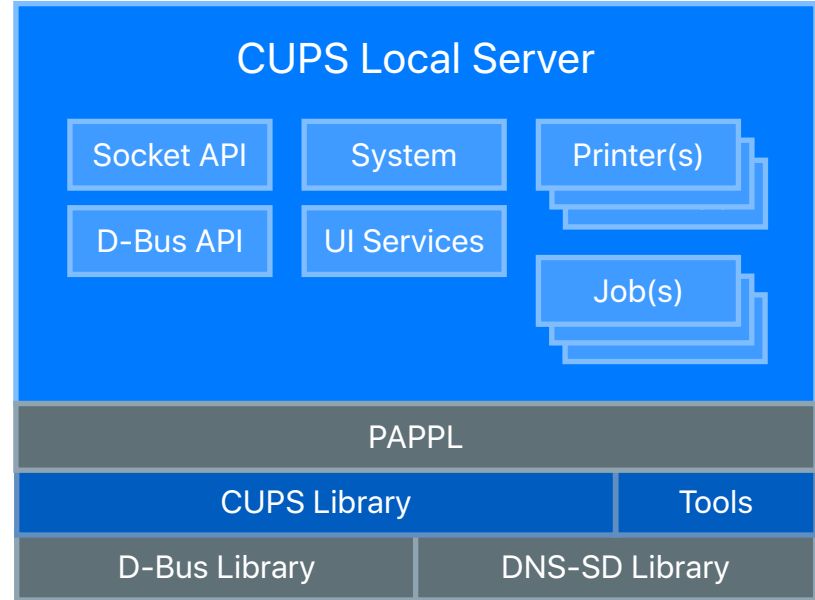


CUPS 3.0 - Library

- New requirements:
 - C99, DNS-SD (Avahi or mDNSResponder), TLS (GNU TLS, LibreSSL, or OpenSSL), ZLIB, POSIX or Windows threading
- New APIs:
 - IPP test file, HTML form, JSON, JWT, and X.509 APIs
- Removed all deprecated APIs
- 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

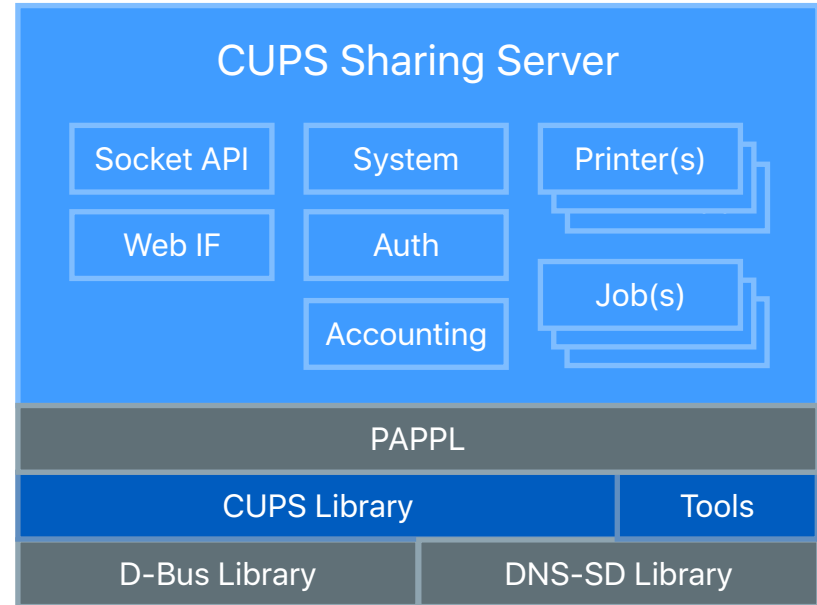
CUPS 3.0 - Local Server

- 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 JWT inspection 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
 - Using PAPPL for the core server bits
 - Existing CUPS 2.x UI code can be updated
- Graphics libraries - current PDF tools/libraries have problematic licenses or other limitations

CUPS 3.0 - Progress

- Commands and Local Server (cups-local project)
 - <https://github.com/OpenPrinting/cups-local>
 - Print commands and basic cupslocald code in place but needs lots of testing
 - 3.0b1 release as soon as PAPPL 2.0b1 is ready
- Sharing Server (cups-sharing project)
 - <https://github.com/OpenPrinting/cups-sharing>
 - No code pushed yet, need to finish PAPPL 2.0 work first
- Tools and Library (libcups project)
 - <https://github.com/OpenPrinting/libcups>
 - Basically complete
 - 3.0rc1 release soon

Resources

- CUPS Web Site
 - <https://openprinting.github.io/cups>
 - CUPS v3 information:
 - <https://openprinting.github.io/cups/cups3.html>
- CUPS Repositories
 - <https://github.com/OpenPrinting/cups>
 - <https://github.com/OpenPrinting/cups-local>
 - <https://github.com/OpenPrinting/cups-sharing>
 - <https://github.com/OpenPrinting/libcups>