

Status of Printing in Chrome OS May 2020

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Sean Kau (skau@chromium.org)

What is Chrome OS?

Speed, Security, Stability, Simplicity

Personal computers. Laptops, Desktops,
Convertibles, Tablets and All-in-ones.

Open Source, based on Linux, runs Android &
Linux apps

Devices made by many different OEMs



Outline

- Review of ChromeOS Printing Stack
- Notable Improvements since April 2019
- Ongoing Issues
- Future Work

Review of ChromeOS Printing Stack

- Chrome detects printers via Chrome Policy, mDNS, user setup, and udev events
 - Printers setup using Driverless or with PPD from PPD repository
- Chrome communicates with CUPS via Unix socket
- Chrome <-> CUPS communication uses IPP
- Print jobs are sent to CUPS in PDF
- CUPS uses PPD or Driverless Configuration to configure the filter pipeline
- CUPS transforms document from PDF to PDL w/ transformations
- CUPS sends job via the appropriate backend for the protocol

Notable Improvements

- job-password for Driverless printers (M-75)
- Automatic USB Printer Setup (M-76)
- requesting-user-name, document-name (M-77)
- Advanced Print Attributes (M-79)
- Media Size Matching (M-79)
- Print Preview for Play Store Apps (M-80)
- Print Server Support (M-81)
 - CUPS Compatible
 - IPP System Service (Planned)
- PWG-Raster Improvements
 - Collation support (M-83)
 - Setting Copies (M-85)
- Improved Utilization of ClusterFuzz
- PPD Index Improvements
 - 6538 Models (May 4, 2020)

M-75 -> M-77

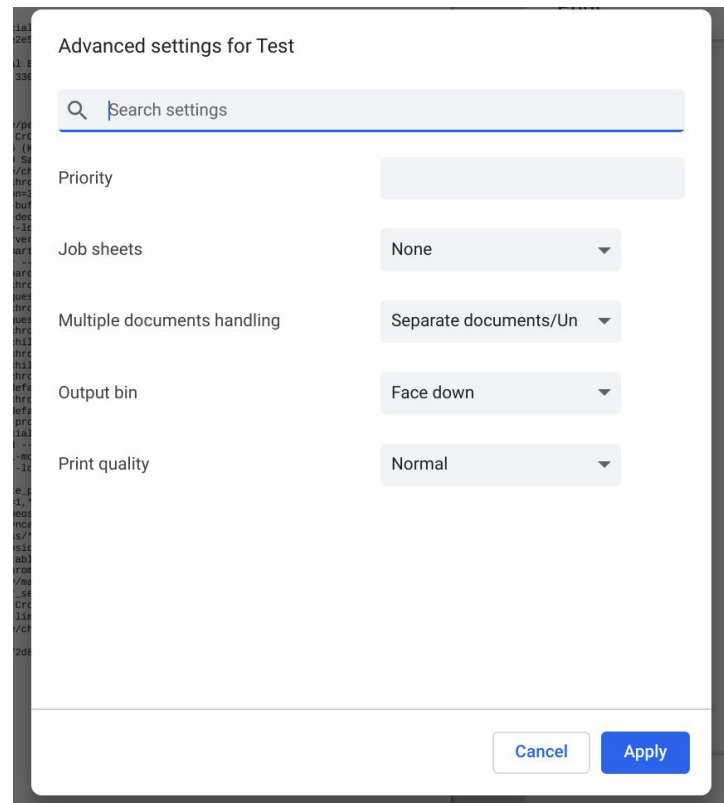
- May 28 -> Sep 3, 2019
- job-password for Driverless printers (M-75)
 - PIN Support
 - Enabled via Chrome Policy
- Automatic USB Printer Setup (M-76)
 - Streamlined setup experience for users
 - User alert upon device plugin w/ Automatic setup
- requesting-user-name, document-name (M-77)
 - Enabled via Chrome Policy
 - Enabled only for TLS connections
 - Default values: chronos and Untitled

M-79

- Dec 3, 2019
- Media Size Matching
 - Switch CUPS media-size matching to use dimensions instead of names
 - Many PPDs have small rounding errors in media size that prevent matching margins and ImageableArea correctly
 - Noticed that we weren't seeing ISO B5 for some printers
 - Removes media that has multiple names e.g. Ledger (11x17) and Tabloid (17x11)
- Advanced IPP Attributes
 - See next slide

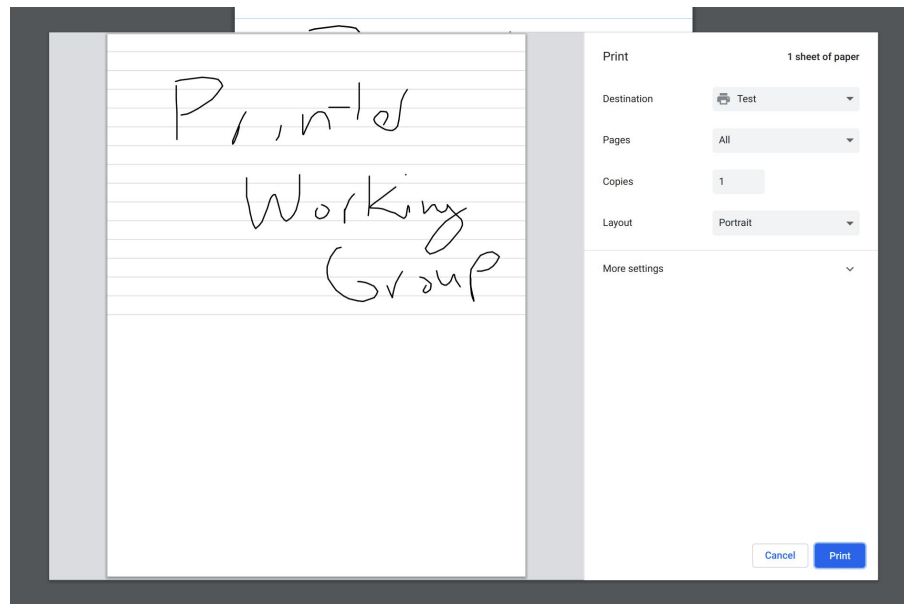
Generic IPP Attribute Support (M-79)

- Common IPP attributes shown with friendly names
- Localized display
- Shows the remaining values from CUPS that were not previously configurable in Chrome
- Synced from IANA values



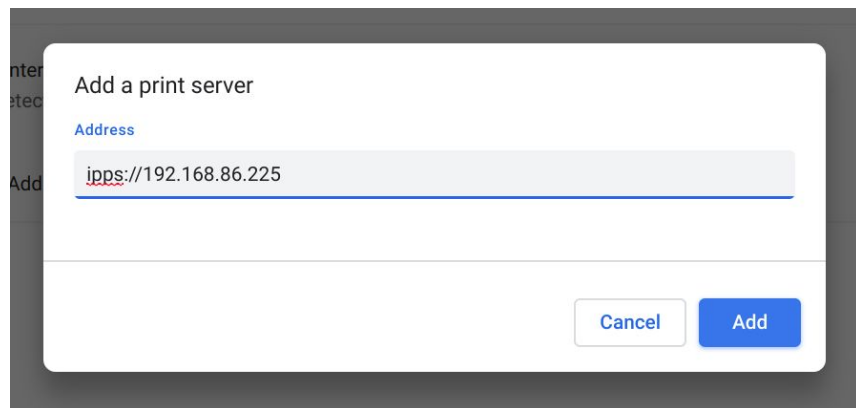
Print Preview for Play Store Apps (M-80)

- January 28, 2020
- Android Apps in ChromeOS use Chrome Print Preview and respond to changes in paper size
- Apps also get access to any printer otherwise available in ChromeOS



Print Server Support (M-81)

- Compatible with CUPS and IPP System Service (Planned)
- Persistent server support available via policy
- User configurable as a discovery mechanism
 - i.e. Select Print Server then select printer
- Performs Driverless setup for PWG-Raster and PDF endpoints



PWG-Raster Improvements

- Collation support (M-83 Stable soon)
 - Use the correct IPP Attribute: multiple-document-handling
 - NOT sheet-collate
- Copies (M-85 ~Aug 18, 2020)
 - Added support to CUPS to read the copies-supported value in Driverless setups
 - Adding document-format to Get-Printer-Attributes request to get the correct copies value
 - Currently reworking solution with fallback behavior
 - Some printers do not handle requests with document-format properly

PPD Index & ClusterFuzz

- ~6500 PPDs from various sources
- Working to improve cadence of imports, especially from Foomatic
- Goal to reduce import latency to ~2 weeks for Foomatic

- <https://github.com/google/clusterfuzz>
- Ongoing testing for bugs and vulnerabilities
- Some projects under test:
 - CUPS PPD Parsing
 - CUPS IPP Parsing
 - gstoraster PDF handling
 - Various Chromium code
 - Various ChromiumOS services (ippusb_manager)

Ongoing Issues

- Varying support for PDF in Printers encountered in the field
- mDNS resolution can be flaky with some devices in power save

Current Projects

- Investigating OAuth & IPP
 - Possible proposal to extend standard
- Further improvements in Driverless printing and feature fidelity
- Expanded printer compatibility - Driverless, filters and PPDs
- Expanded Test Coverage
 - More IPP tooling for automated testing ([Tast](#))
 - Enhancements in [virtual-usb-printer](#)

Questions?

Thanks!