

# OpenPrinting Summit 2009

San Francisco, CA

April 8-10, 2009

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# Subjects

- Common Print Dialog
- Printing From Applications
- Color Management
- Driver Validation
- Multifunction Device Support
- Driver Auto Load/Install

# Common Print Dialog

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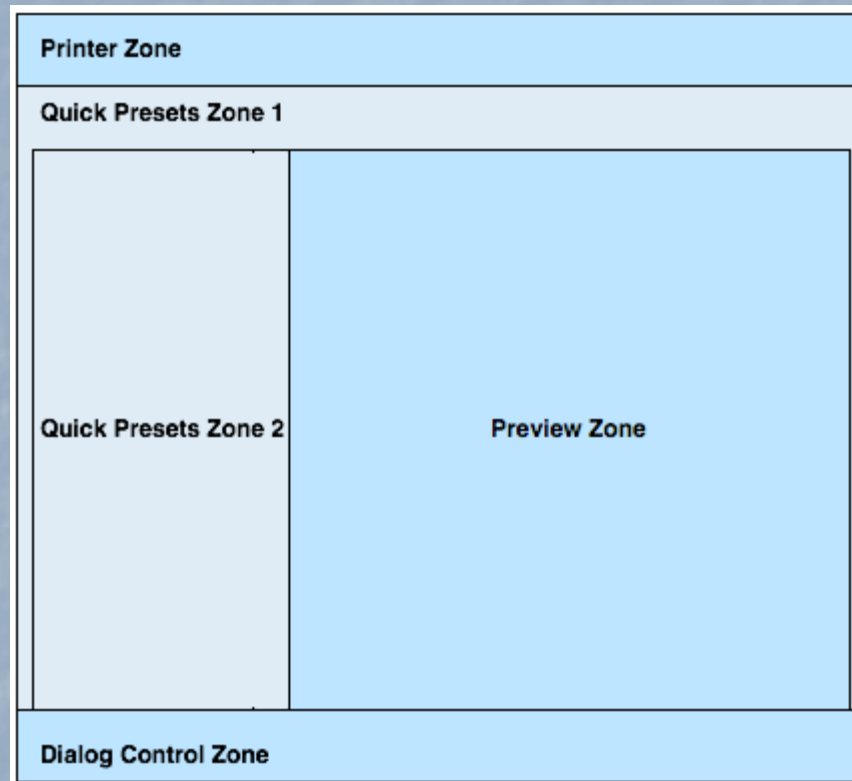
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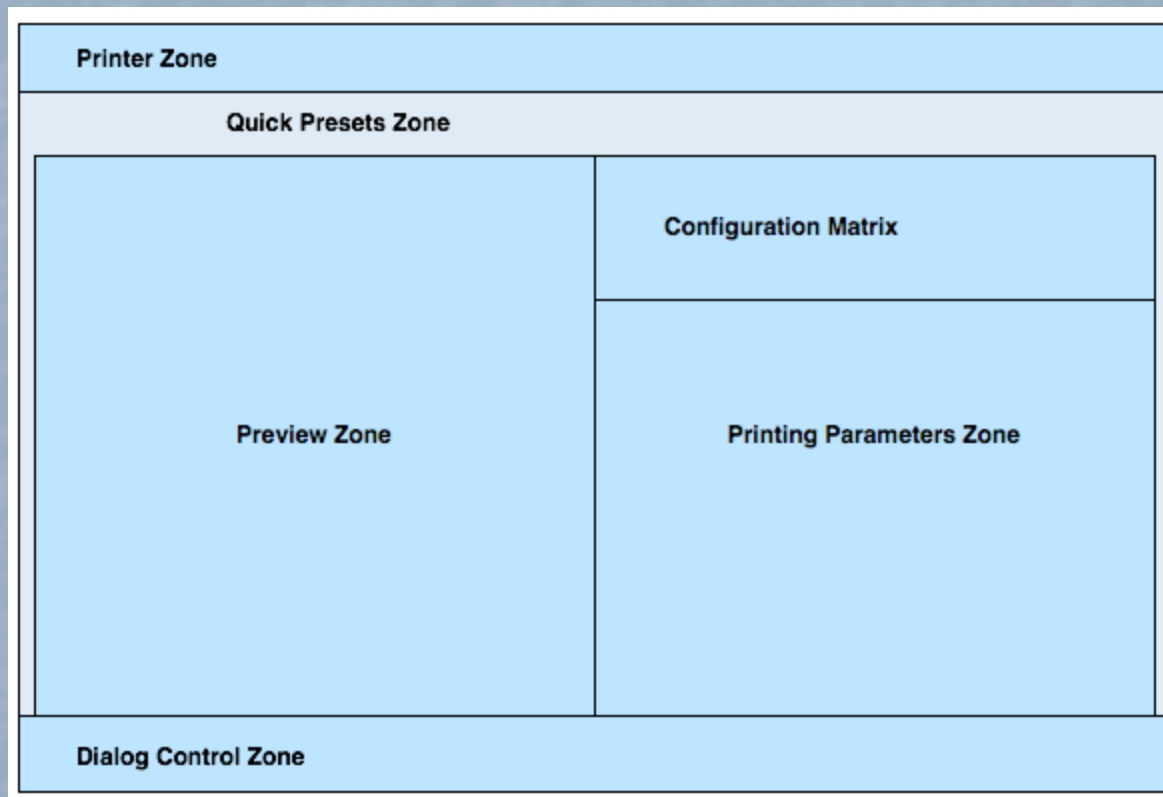
# Common Print Dialog

- Epson Request Support for Mobile & Embedded Solutions
  - Level 1: Mobile Device
    - Target: Mobile Devices with a screen of limit size.
    - Structure: Printer Zone, Quick Preset Zone and Control Zone.  
The width all zones is set by the Quick Preset Zone.
    - Usage: The caller (application, OS, whatever) must define all printing "modes" by means of Presets.
  - Level 0: Embedded Device
    - Target: Embedded devices, GUI-less devices, special needs.
    - Structure: No GUI interface but same functional capability.
    - Usage: The caller (application, OS, whatever) sets the printer and options value (based on some internal determination); the GUI-less CPD returns the "print intent" information based on the callers input. This way the caller can use a different with same set value but get the correct "print intent" values for the specified printer.

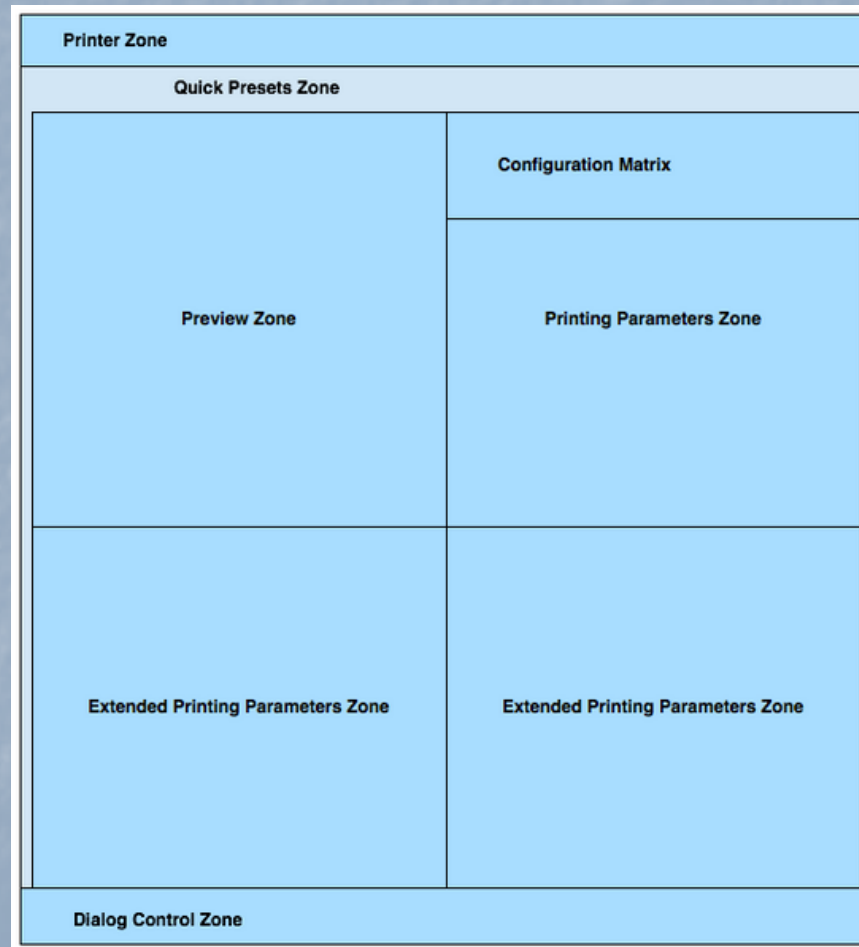
# CPD Level 2



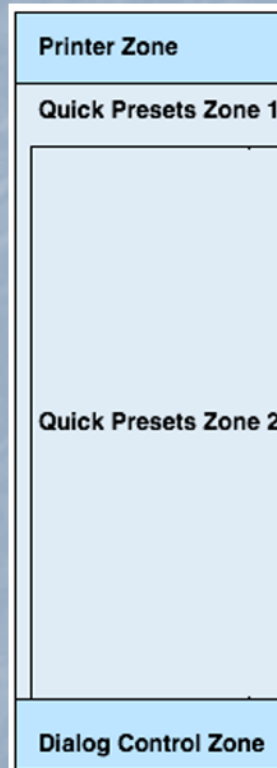
# CPD Level 3



# CPD Level 3: Expanded



# CPD Level 1



# CPD Level 0

GUI-less

# CPD Specification

- Currently CPD Specification is implemented by extending the existing PPD files.
- Epson Request an Independent CPD Specification File.
  - Still use currently Extended Format Proposed for PPD Files but no Printer need be defined.
    - It contains only CPD content.
      - Example: Only Quick Presents
  - Intended for Support of Mobile and Embedded Solutions

# Printing From Applications

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# Printing From Applications

# Color Management

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# Color Management [CM]

- What is it?
- Who Needs it? Why?
- About Printer Profiles
- To Create Printer Profiles
- Suggestions & Discussions?

# CM: What is it?

- What is it?
  - Device profiles provide color management systems with the information necessary to convert color data between native device color spaces and device independent color spaces.
  - The specification divides color devices into three broad classifications:
    - input devices,
    - display devices and
    - output devices.
  - For each device class, a series of base algorithmic models are described which perform the transformation between color spaces.
  - These models provide a range of color quality and performance results which provide different trade-offs in memory footprint, performance and image quality.

<http://www.color.org/iccprofile.xalter>

# CM: Who Needs it? Why

- Color Fidelity depends Intent.
  - What is being printed?
    - Needed: High End Photo, Posters, Banners,...
    - ~ Needed: Web Pages, Text Document, Home Photos, ....
  - Why is it being printed?
    - Needed: Color Matching intent, ...
    - ~ Needed: Short term document use, ...
  - Who is printing it?
    - Needed: Semi/Professional Photographer, Print Shops, ...
    - ~ Needed: Home User, SOHO, General Office, ...

# CM: About Printer Profiles

- Printer Profile Factors
  - Printer Inks:
    - Number of Inks
    - Inks Color (= gamut)
  - Driver Dither/Halftone Algorithm
    - Type of Dither/Halftone (Speed Vs Size Vs Resources)
    - Dot Size of Printer Head (Fixed, Variable)
  - Color Transform Algorithm
    - Fidelity (Speed Vs Size Vs Resources)
    - Color Overlay Order
    - Linearity of Color “Addition”
- Summarized:
  - For each set of Inks & for each Driver a Profile is needed for each combination of
    - Media Type (Plain, Matte, Fine Art, Photo, CD/DVD, etc – 10 to 100 type of media)
    - Quality Intent (Draft, Normal, High, Photo)

# CM: To Create Printer Profiles

- Printer Driver Developer Needs
  - The Printer
  - Supply of Inks
  - Supply of Media Types
  - Spectrometer or External Measuring Service (Cost ~\$30 USD per profile).
  - Test Time
- Issues
  - For “Open Source” Developer is profiling too costly; timely?
  - For Mobile/Embedded Platform Too Large
    - A Single ICC profile (for one mode) can be 6+ MiB (x media type x quality=?)
  - Can't Use Print Vendor Existing Profiles since they are the result of the Print Vendor's Driver Algorithms not another's.
    - Windows: \Windows\system32\spool\drivers\color \
    - Mac: /Library/ColorSync/Profiles/
    - Linux: ????????????????

# CM: Suggestions/Solutions

- Print-Vendors:
  - Supply ICC Profiles (see below for what media type and quality)
  - Allow Public Domain Use of ICC Profile.
- Non Print-Vendors
  - Use Printer-Vendors ICC Profile
    - “Close Enough”: Ok for non-critical uses.
  - OpenPrinting Provides a Low Cost Profile Measurement Service.
- OpenPrinting and/or Color Management
  - Define a Base Set of Media Type that MUST BE Supported.
    - Plain, Photo, etc is often media supplier dependent
    - Thus, Must Define Media Type by some set of Attributes:
      - Brightness, roughness, etc.
  - Define the Nominal “Quality Settings” for Each Media Type that MUST BE Supported.
    - Does this mean DPI Range (Example: Normal = 300 to 400 dpi)
    - Does this mean an quantitative evaluation of a test image with resolution targets
  - Provide Profile Test Images and Instructions.

# Resolution Targets

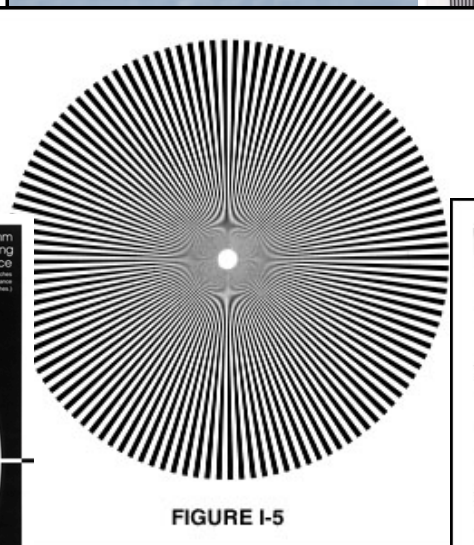
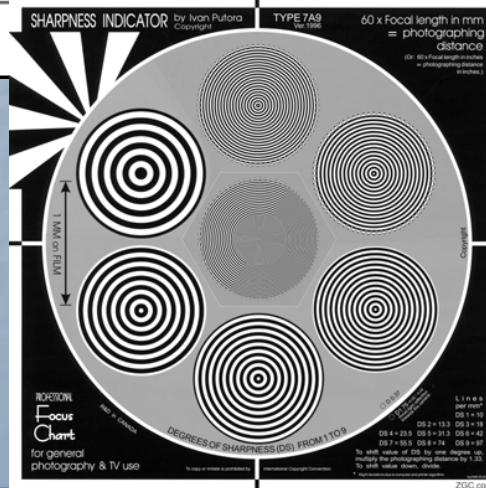
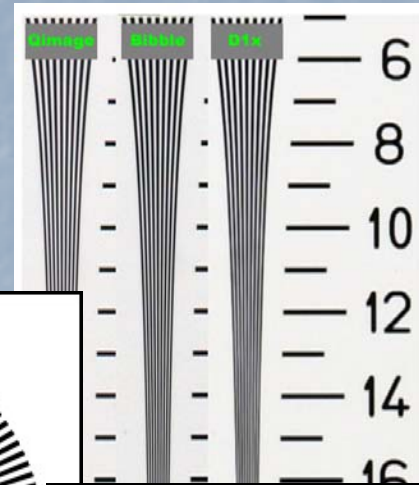
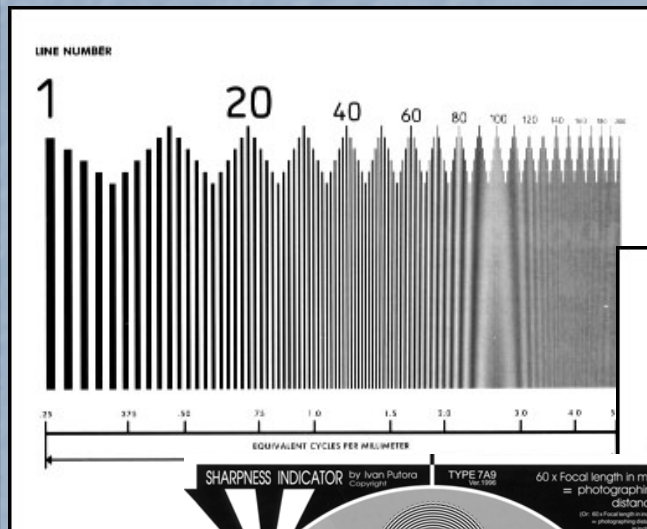


FIGURE I-5

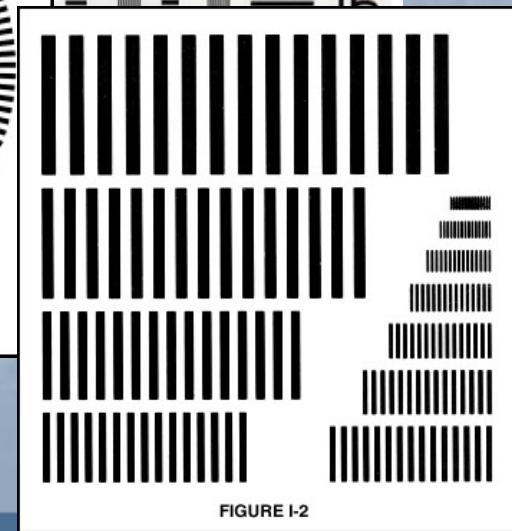


FIGURE I-2

# Media Type

- RFC's, documents & discussions that List Media Types.
  - More investigation is needed to define Media Types in terms of attributes that can be gotten from the WWW or label on media package.

# Printer Driver Validation

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# Printer Driver Validation (PDV)

- What is PDV?
  - Self-Validation by Driver Developer
    - No Certification by Distro's or Central Organization (LSB, OP)
    - Distro's or Central Organization (LSB, OP) can also perform Self-Validation
  - Includes Driver Packages and PPDs
- What is PDV Not?
  - Validation of Distro Print Path (App -> ? -> ? -> ? -> Driver)
  - Validation of Print Transform Applications (PS/PDF > Image, ...)
  - Validation of Print Managers (LPR, CUPS, ...)
  - Validation of Application Printing (GIMP, OpenOffice, ...)
- What is Needed?
  - Test/Testing Criteria
    - What is being tested.
  - Test/Testing Procedure
    - How to test.
  - Validation Result Summary Submission
    - How to deliver the results, drivers and PPDs
  - Will exceptions be allowed?
    - What are they? What are the exception parameters?

*These would be Print System/Solution Validation – Done by Distro's*

# PDV: What is Being Tested

- Driver Package
  - [yes] Installation
  - [yes] Interfacing from/with CUPS
  - [yes] Interfacing from/with Applications
  - [yes] Interfacing from/with Transform Applications
  - [yes] Driver Back-Ends
  - [tbd] “Standard” Print Capability
  - [no ] Print Quality – *Too Subjective*
  - [no ] Printing Performance – *Too Subjective*
  
- PPD
  - [yes] PPD Base Attributes
  - [yes] CUPS PPD Extension Attributes
  - [yes] CPD PPD Extension Attributes

# PDV: What Else Might Be Tested

- Driver Package – Print Capability
  - [ ] Support Min Set of Media Sizes
    - [ ] Letter [ ] A4 [ ] B4 [ ] 4x6 [ ] CD/DVD [ ] ???
    - Exception: Not Limited by printer carriage / media-handler.
  - [ ] Support Min Set of Media Types
    - [ ] Plain [ ] Matte [ ] Fine Art [ ] Photo [ ] ???
  - [ ] Support Min Set of Print Quality
    - [ ] Draft [ ] Normal [ ] High
  - [ ] Margin Setting
  - [ ] Driver Supplied Preview Image
  - [ ] Status Monitoring
  - [ ]
- PPD
  - [ ] CPD Predefine Modes
    - [ ] Text [ ] Web [ ] Doc [ ] Image [ ] Photo [ ] CD/DVD [ ] ???

# PDV: How to Test - Drivers

- Test Print Data
  - Images, Simple Text, Complex Text, PostScript, PDF, Web Page, Mix Content
  
- Scripts
  - Install Driver
  - Update/Replace Driver
  - Un-Install Driver
  - Exercise Printing Min Features:
    - Via CUPS
    - Via Ghostscript
    - Via OpenPrinting Application (TBD)
  - Exercise Printing Status Monitor
    - Via CUPS
    - Via Ghostscript
    - Via OpenPrinting Application (TBD)

# PDV: How to Test – PPDs

- Use Existing OpenPrinting Submission Procedure and System.

# PDV: How to Deliver Results

- The output of the Script File provide a ZIP file with
  - Identification File
    - Developer Identification and Company
    - Printer(s) Supported by Driver and PPD
  - Text File of Driver and PPD Test Result
  - Driver under test - May be limited to Binaries only
  - PPD under test
  - ICC Profile(s) under test (if any)
  - Document for Driver (if any)
  - Exception Document (if any)

# PDV: Exceptions to Document

Exception Data Need by Script to Perform Testing

Example – Final / Correct List To Be Determined.

- **Printer Only Supports**  
(Some/Most content below could be obtain from PPD file)
  - Photo Printing Only
  - Black Only Printer
  - Specific Media Sizes Only
  - Specific Media Weights Only
- No Printer / Driver Specific ICC Profile
- No Status Monitoring Support
- To Be Determined.