

eCups

Next Generation Printing Support for OS/2

Warpstock Europe 2011

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eCups

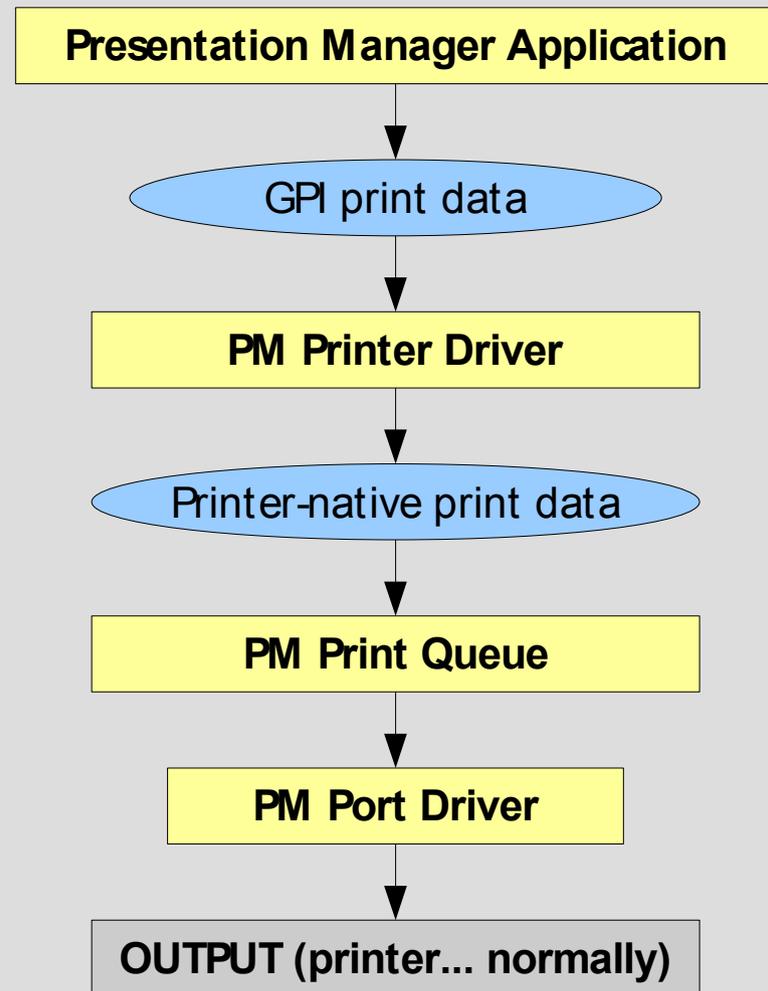
- What is it?
 - eCups is a new printing framework for OS/2 and eComStation, based on CUPS (the *Common Unix Printing System*)
- Why do we need it?
 - OS/2 printer drivers are no longer provided for current-model printers
 - While OS/2 continues to support PostScript printers, most consumer-grade printers are not PostScript, and need specific drivers
 - eCups provides a potential solution

How Printing Works

- Every printer has its own native “language”
 - Expects to receive print data in that language
 - Language tends to vary according to manufacturer
- Printing to any printer requires:
 - A. Translating print data into the printer's language
 - B. Sending that data to the printer
 - C. Job management/sequence control
- Under OS/2 (by means of a *printer object*):
 - A = Printer driver (via individual printer device)
 - B = Port driver (via individual printer port)
 - C = Spooler (via individual print queue)

Printing Under OS/2 Presentation Manager

- Print jobs are sent as GPI data
 - The printer driver converts them into the printer's native format
- Plain text & printer-native data are also accepted
 - These can be passed straight on to the printer



OS/2 Printer Drivers

- Rather than supporting just one printer, most OS/2 printer drivers support an entire class of printers (usually based on a common printer language).
 - For this reason they are sometimes called *PrinterPak* drivers
 - Common OS/2 printer drivers include:
 - LASERJET (PCL-based printers)
 - EPOMNI[1-5] (Epson inkjet printers)
 - OMNI (Various models, mostly inkjets)
 - **PSCRIPT** (**PostScript printers**)

PostScript Printers

- Some printers use PostScript as their “native” language
 - PostScript is a well-defined, standardised language
 - Allows generic support across PostScript devices
 - Printer-specific capabilities are defined in PPD files
- Any PostScript printer can be supported by “importing” its PPD file
 - The OS/2 PostScript driver includes a utility (PIN) for this purpose
 - Therefore (in theory) any PostScript printer – old or new – can be fully supported on OS/2!

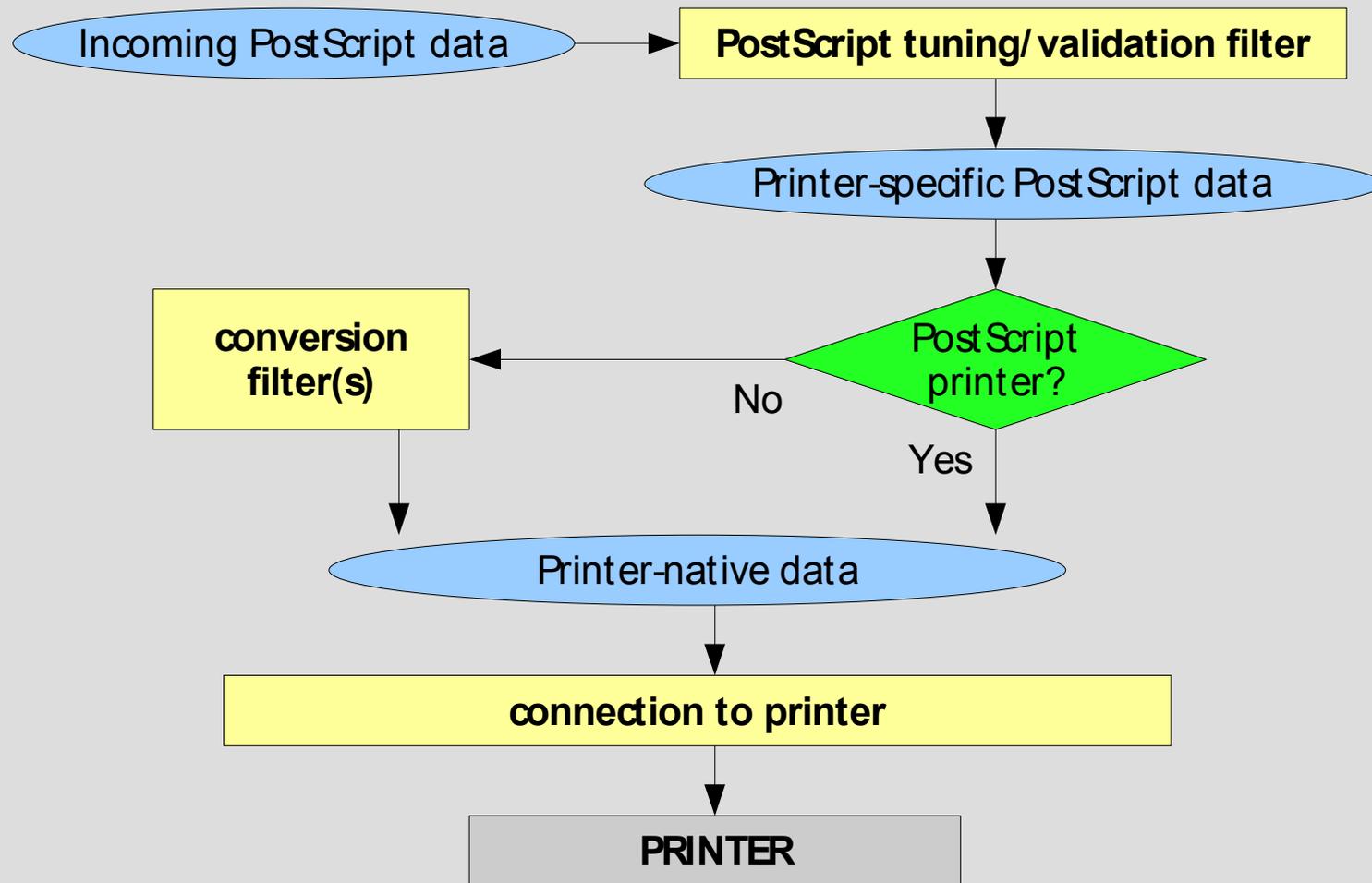
Printing Under Unix

- Unix is not an OS but a whole family of OSes
 - There is no common GUI environment
 - There is no unified data format (like GPI) for applications to use for their print jobs
 - There is no real standard for print spooling
 - (LPD is primitive, and different implementations are not perfectly compatible)
- Applications often have to provide their own printer drivers for each printer *and* each OS!

Common **U**nix **P**rinting **S**ystem

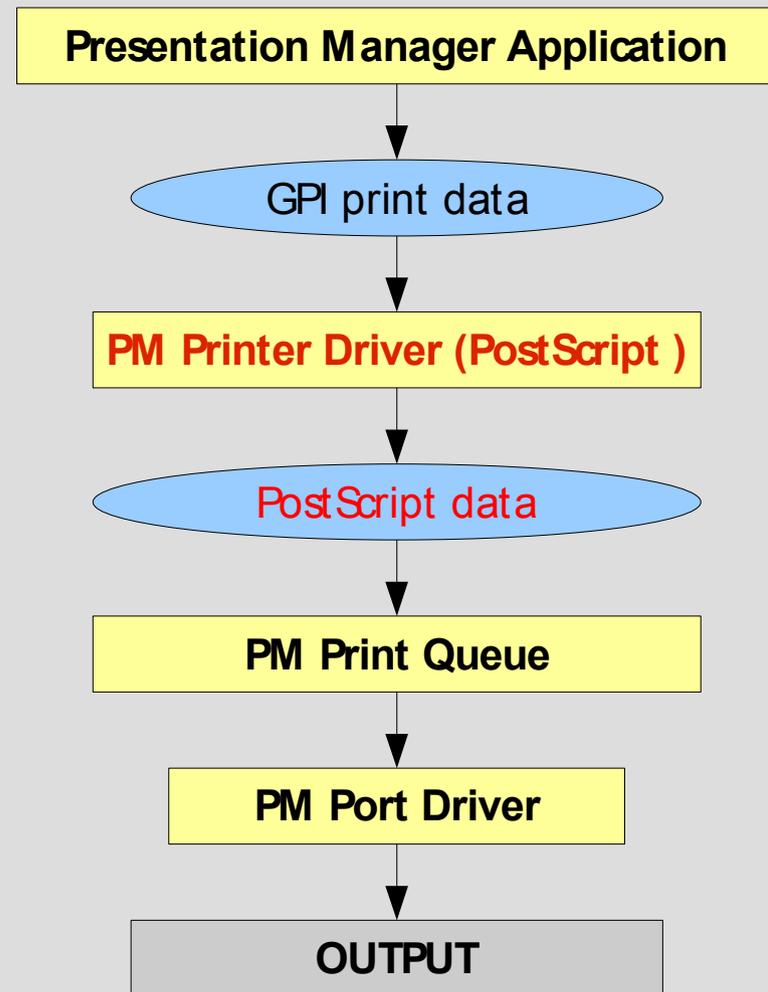
- All print jobs are PostScript files
 - All PostScript printers can print these files natively
 - For non-PostScript printers, conversion filters are provided which can convert PostScript into that printer's native language
- Applications generate print data in PostScript format
 - CUPS accepts a few other formats (e.g. plain text, PDF, some types of image files) which it can convert to PostScript itself
- Effectively, all printers are now PostScript!

Overview of CUPS Operation



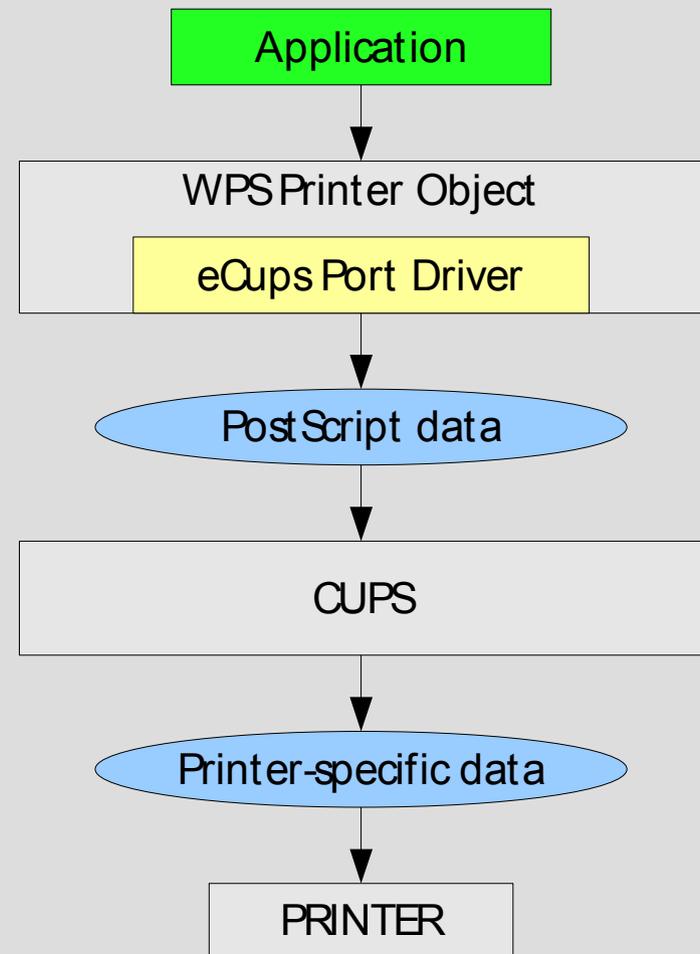
How eCups Works (1)

- The normal OS/2 print process, with a PostScript driver →
 - The final output is a PostScript file
- What does CUPS expect as input?
 - A PostScript file!
 - Hmm...



How eCups Works (2)

- Applications print to a WPS printer object
- Special eCups port driver redirects the output to CUPS
- CUPS converts the PostScript and sends it to the actual printer



Installing eCups (1)

- Components:
 - CUPS (daemon, filters, and support files)
 - Ghostscript (used for PostScript data conversion)
 - eCups port driver
 - Printer support package – at least one of:
 - Gutenprint (drivers for most printers)
 - Splex (various Samsung and Xerox printers)
 - HP-LIP (various HP printers)
 - Other support packages (foomatic/foo2qpd, etc.)
 - PostScript printer driver, one of:
 - ECUPS.DRV (default)
 - ECUPS-HP.DRV (for use with HP-LIP)

Installing eCups (2)

- Default method: installing from ZIP files
 - Unzip eCups port driver to \OS2\DLL and install from WPS
 - Unzip ECUPS.DRV / ECUPS-HP.DRV to any directory, and use the WPS to install it from there
 - Unzip all other packages to the **root directory** of a single drive.
- Experimental: WarpIN packages (WPI)
 - Download WPI packages for each component required.
- Upgrading: install on top of previous version

Configuring eCups

- Make sure the eCups port driver is installed
- Check the path to Ghostscript in:
 - `\cups\lib\cups\filter\pstoraster`
 - `\cups\etc\foomatic\filter.conf`
 - `\cups\bin\foo2qpd1-wrapper`(This is also required when upgrading Ghostscript)
- When upgrading GutenPrint:
 - Edit all Gutenprint printers in the CUPS Administration GUI and re-select the PPD files

Printing with eCups

- Three steps to set up a printer:
 - Create a printer in CUPS itself
 - Create a desktop (WPS) printer object
 - Create a port (**CUPSx**) to connect the two
- A graphical tool to automate this process is still under development

Creating a CUPS Printer

- Select built-in model or import PPD file
- Select back-end (printer connection)
 - USB
 - TCP/IP (IPP/LPD/AppSocket)
 - SMB
- Assign name
- Set job options
- Print a test page!

Creating an OS/2 Printer

- Desktop 'Printer' template, eComStation 'Install Printer' tool, etc.
- Select the driver/model
 - 'Other printer driver' → path to ECUPS files
 - If not listed, it may be necessary to import from PPD

Creating a Printer Port

- Make sure CUPS.PDR is in `x:\OS2\DLL`
- Printer object properties → 'Output Port' → 'Install New Port'
 - Select 'CUPS' port type
- Set port properties (double-click on port)
 - Server: usually 'localhost'
 - Printer name: as defined in CUPS

Troubleshooting (in CUPS)

- Make sure CUPSD.EXE is running
- Make sure you can print test page from CUPS web console and/or using CUPS lpr
- CUPS error log
 - Turn on detailed logging if necessary
 - Try and isolate the failing program/filter (e.g. pstoraster, Ghostscript, foomatic-rip, etc.)
- Make sure path to Ghostscript is correct
- Make sure the network URI is correct/valid

Troubleshooting (in WPS)

- Printing from application fails:
 - Use ECUPS or ECUPS-HP, not PSCRIPT
 - Make sure server and printer name are correct
 - Make sure CUPSD.EXE is running
- Cannot edit driver/job properties in printer
 - Make sure EAs on ECUPS[-HP].DRV are intact
 - With imported PPDs, verify existence/timestamp of `x:\OS2\DLL\...\AUXPRINT.PAK`
 - Reinstall driver if necessary

Future Plans

- Simpler installer (WarpIN)
- Integrated printer creation GUI
- More/better documentation
- ... Suggestions?

Online Resources

- eCups website:
<http://svn.netlabs.org/ecups>
 - Overview, files, links
 - HOWTO (illustrated), Frequently Asked Questions
- CUPS:
<http://www.cups.org>
 - Manuals, forums, API documentation
- OpenPrinting database:
<http://www.openprinting.org/printers>
 - Model and driver look-up

Questions?

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