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 Printer Pak 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 Unix Printing System

- 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

- Incoming PostScript data
  - PostScript tuning/validation filter
  - Printer-specific PostScript data
    - PostScript printer?
      - Yes
        - Printer-native data
          - connection to printer
            - PRINTER
      - No
        - conversion filter(s)
          - Incoming PostScript data
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)
    - Splix (various Samsung and Xerox printers)
    - HP-LIP (various HP printers)
    - Other support packages (foomatic/foo2qpdl, etc.)
  - PostScript printer driver, one of:
    - ECUPPS.DRV (default)
    - ECUPPS-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](http://svn.netlabs.org/ecups)
    - Overview, files, links
    - HOWTO (illustrated), Frequently Asked Questions

- **CUPS:**
  - [http://www.cups.org](http://www.cups.org)
    - Manuals, forums, API documentation

- **Open Printing database:**
  - [http://www.openprinting.org/printers](http://www.openprinting.org/printers)
    - Model and driver look-up
Questions?