Common UNIX Printing System Roadmap

Michael R Sweet
Easy Software Products

CUPS Development for 2006-2007

- Current roadmap available on cups.org
- Tentative release schedule:
  - *December 2006 - CUPS 1.3, CUPS DDK 1.1*
  - *June 2007 - CUPS 1.4*
  - *December 2007 - CUPS 1.5*
- Monthly PPD releases from the cups.org printer driver database (CUPS-specific)
- Transition of ESP Ghostscript code/patches to main Ghostscript tree
- Print dialog UI extensions

CUPS 1.3 Highlights

- Kerberos authentication
  - *Existing cupsDoAuthentication() function provides application support transparently (no code changes in apps/toolkits!)*
- Side-channel API
  - *Provides out-of-band communication with backends to get the interface state, get the current 1284 device ID, and do a "soft reset" of the interface*
- New USB backend
  - *libusb and direct Linux kernel interface support*

CUPS 1.3 Highlights

- Scheduler
  - *Printer PPD/attribute cache (faster startup)*
  - *CUPS-Get-PPDs supports ppd-make-and-model and ppd-device-id lookups*
  - *Use poll(), epoll(), or /dev/kqueue instead of select()*
  - *LDAP browsing improvements*
- Web interface
  - *Change the name of auto-detected printers*
  - *Auto-configure printers using SNMP*
  - *Other SNMP improvements (configure, partial probes, etc.)*
  - *Improved on-line help searching*

CUPS DDK 1.1 Highlights

- Support for multi-language PPDs
- New "ppdmerge" utility
  - *Allows vendors to produce multi-language PPDs easily from existing single-language PPDs*
- New CUPS driver interface
  - *Allows vendors to ship PPD compiler source files (*.drv, *.po) instead of/with pre-generated PPD files*
- Updated Epson and HP raster drivers
  - *Support for Epson impact and newer inkjet printers*
  - *Additional PJL option support for PCL printers/plotters*

CUPS 1.4 Highlights

- DNS-SD a.k.a. Bonjour
  - *Already standard on Mac OS X*
  - *Used for printer discovery, printing, and printer sharing*
  - *CUPS 1.4 implementation will address scaling issues (no more 1 file descriptor per shared printer)*
- Standard IPC between filters and applications
  - *Will allow drivers to prompt the owner of a job with a message and 1-3 action buttons*
  - *Implementation TBD*
  - *Need to be careful about security - we don't want to repeat Microsoft's "Windows messaging" mistakes*

CUPS 1.4 Highlights

- Image printing
  - *Scaling mode that ignores margins*
  - *Multi-page TIFF support*
  - *Improved BMP support*
- Web interface
  - *cupsd.conf templates*
  - *Custom option support*
  - *Other usability improvements*
- CUPS API
  - *New async request interface*

CUPS 1.4 Highlights

- PDF support
  - *Use poppler instead of embedded Xpdf code*
  - *Add support for N-up, page selection, and other printing options*
  - *pdftoraster (ESP) for direct printing of PDF files to non-PS printers*
  - *pdftopdf (Japan) for direct printing of PDF files to PDF-capable printers*
    - *New cupsJCLToPDFInterpreter attribute in PPD file*
  - *imagetopdf (Japan) for direct printing of image files to PDF-capable printers*
  - *texttopdf (ESP) for direct printing of text files to PDF-capable printers*

CUPS 1.5 and Beyond

- Networking features
  - *Listen on an interface*
  - *Selective sharing on specific interfaces*
- Various job processing features
  - *RIP to disk*
  - *Preprocess job files*
- Better plain text printing
  - *More charsets, XHTML-Print, etc.*
- Server plug-ins
  - *Custom IPP policies, job accounting, job handling, quotas, etc.*

ESP Ghostscript Transition

- Current ESP Ghostscript is based on old 8.15 Ghostscript release
- Current Ghostscript (8.54) is now provided under GNU GPL
- Ideally want to merge ESP Ghostscript changes back into GPL Ghostscript
  - *Maintain one version of Ghostscript, not N versions*
  - *Non-Artifex drivers can be placed in a separate subdirectory for convenience ("addons" and "pstoraster" for ESP Ghostscript)*
  - *Get current ESP Ghostscript developers involved with GPL Ghostscript development?*

Print Dialog UI Extensions

- Driver and application developers want to add their own options/controls/views
- Can't rely on binary plug-ins installed on the local computer since the printer might be shared from another system with a different OS or CPU
- Can't rely on the user or application using the extensions
- Localization is important
  - *So is conforming to the HIG of the local desktop environment*

Print Dialog UI Extensions
Requirements

- Support systems with little memory, CPU, or display
- Support non-graphical printing
  - *Drivers can't depend on the user selecting or entering information*
- Cross-platform
  - *Different operating systems, CPUs, and run-time environments*
- Cross-desktop
  - *KDE and GNOME (at least) on Linux, Aqua on OS X, etc.*
- Support localization/I18N
- Controls/capabilities are TBD

Print Dialog UI Extensions
Embedding in PPD Files

- PPD attributes can have arbitrarily long values, allowing for XML and other types of data to be embedded
- Offers a backwards-compatible solution
- Solves the shared printer problem
- Identifying the UI requirements and the language to use for the UI is the key issue!

Print Dialog UI Extensions
UI Description Languages

- Mozilla's XML User-Interface Language (XUL)
  - *Pros: well-established, developer tools available, several implementations*
  - *Cons: XULrunner is big (25MB on Linux i686, compiled), uses multiple files (may be hard to embed)*
- GNOME's Glade
  - *Pros: Already available to GTK+ apps via libglade, developer tools available, libglade is LGPL and small*
  - *Cons: no scripting support, controls have to be hooked up to handlers via signals*

Print Dialog UI Extensions
UI Description Languages

- OASIS's UIML
  - *Pros: Open standard, scripting support, platform/vendor/desktop neutral*
  - *Cons: May be too simple, not widely implemented/accepted, layout of controls not specifically under developer control*