



Printing on Client LINUX

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October 2006

Purpose

- Examine state of Desktop Linux printing as of 8/2006
- Limit scope of project to desktop printing
 - examine popular home user/small office printers
 - no larger specialized printers
 - Try to stay with Desktop Linux distributions
 - Use current distros available for normal users
 - Limit to USB interfaces
 - USB is common to all the printers tested

Scope of the Problem

- Expectations of printing are: “plug in and start printing”
 - How much knowledge does the user need?
- “Plug-and-play” requires recognition of the hardware from the kernel through userspace
 - HAL sees a new device
 - Something in the print system notices the new printer and add/suggests the driver
- Stakeholders
 - printer users
 - print driver writers

Test Hardware Setup

Intel “Alderwood” Development system with 3.6GHz Xeon processor and 1G of memory (according to dmesg)

Five current, non-beta Desktop OSes

- Ubuntu 6.06 updated on 8/29
- Debian Etch updated 8/29 (not really a desktop OS)
- Fedora Core 5 updated 8/29
- SUSE Linux Enterprise Desktop 10 updated 9/5
- Mandriva 2006 updated 9/5
- Mandriva Free 2007 (the one new OS)
- RedHat Enterprise Linux Client 5 Beta 1 (the only beta OS)
- “Default” desktops used: no KDE, only Gnome



Test Hardware Setup (continued)

Five printers tested

- Color inkjet multifunction printers
 - Epson Stylus CX3810
 - HP OfficeJet 5610 All-in-One
- Monochrome laser printers
 - Samsung ML2250
 - HP LaserJet 1022
- Color laser printer
 - Xerox Phaser 6120N

Test Methodology

- Distros installed into separate partitions, updated once and then backed up using Acronis backup.
- Distros restored to a clean slate before each printer is plugged in
- Initial attempt at printing without RTFM
- Standard tests run
 - Check to see if HAL recognizes the printer
 - Check to see if the printing subsystem automatically recognizes the printer
 - If not, see if manual methods allow the printer to be recognized
 - See if the proper driver is selected
 - See if the printer prints some simple documents
 - Printer test page
 - Firefox page
 - OpenOffice page

Results

- Things that worked
 - HAL detect
 - Printer detection
 - Printing (somes required some manual setups)
- Things that need work
 - Automatically appearing setup dialogs
 - Match correct drivers to detected printers
 - Unify workflow of value-added printer management

Results Details (Automatically appearing Dialog Boxes)

- Worked on Mandriva 2006
- Mandriva 2007 added printers automatically
 - No dialog box necessary, but feedback/test would have been nice
 - Samsung ML-2250 had to be added using CUPS HTTP interface (printerdrake errors)
- Did not work on SLED 10.1
 - SLED 10.1's automatic setup "wizard" never succeeded to add a running printer queue
 - The CUPS HTTP interface had to be used
- Worked on RHEL5 when needed
 - HP printers were autodetected/autoadded with no feedback, but the dialog boxes worked with the other printers
- No automatic feedback on Debian Etch or Ubuntu

Correct Drivers for Detected Printers

- Drivers matched to printers by name
- Incorrect drivers were sometimes selected
 - Epson Stylus CX3810
 - CX3200 driver selected but did not work on FC5, SLED10, Mandriva 2006 (needed C64 on FC5, SLED10; C65 on Mandriva 2006)
 - Xerox Phaser 6120
 - Generic PS Printer doesn't work in Mandriva 2006, Mandriva 2007
 - Xerox provided PPD doesn't validate and won't install in Mandriva 2006
 - No Generic PS Printer in SLED10, Debian Etch, Ubuntu
- No way of updating the driver mapping without installing a new print driver package
- Not all distros had easy CD access
 - Debian had no working CD support on this hardware
 - No standard search path on the CD for drivers

Suggestions

- Printer setup popup dialog box on HAL detect is a good idea for user feedback
 - Plugging in the printer does not have to be a quiet event
 - The user should have feedback & a chance to test the printer
- The “detected-printer-to-driver” database should be easy to update
 - Computers with internet access should be able to update the driver database without having to download the entire printing package
 - DB access on linuxprinting.org?
 - Computers with no internet access but with printer CD should have PPDs in standard location
 - Standardize directories on the CD?
 - Location info in standard place on the CD?
 - Recursively search the CD?

Backup

Printer Fiddling – Epson Stylus CX3810

- Incorrect, non-printing older CX3200 driver auto-selected on several distros
 - Mandriva 2006 needed C65
 - FC5, SLED10 needed C64
- New CX3800 driver worked
- Ubuntu, Debian, and Mandriva 2007 had working CX3800 driver

Printer Fiddling – Xerox Phaser 6120

- Generic PS Printer doesn't always work
 - Doesn't work on Mandriva 2006, Mandriva 2007
 - Works on FC5, RHEL5
 - Generic PS Printer not included on SLED10, Debian Etch, Ubuntu
- Xerox provided PPD doesn't validate and won't install in Mandriva 2006
 - Mandriva 2006 appears to have extra validation checks

Printer Fiddling – Samsung ML2250

- Generic PCL works on Mandriva 2006
- ML2250 driver spotty
 - Broken on SLED 10 - output multiple blank sheets
 - Working on Mandriva 2007 but had to use CUPS HTTP interface for setup
- ML2150 driver worked on SLED10, FC5, RHEL5, Ubuntu, Debian Etch

Printer Fiddling – HP LaserJet 1022

- Worked on all tested distros.
- Printer was fast enough to waste paper.

Printer Fiddling – HP OfficeJet 5610 All-in-one

- HP Officejet 5600 driver worked on all tested distros

OS Fiddling

- Ubuntu had the fewest problems (only missing drivers for Xerox Phaser 6120 and HP Laserjet 1022) but didn't have automatic feedback
- Debian Etch had the most problems, but is not a desktop OS
- gnome-cups-add didn't work in SLED10 and Debian Etch; had to use CUPS HTTP interface

Current Linux Printing Pieces

CUPS

- spools files
- has RIP (libcupsimages)
- also has backend functionality
- can access PPD (printer description files)
- can interface with foomatic

ghostscript

- GPL rip
- includes OpenPrinting vector which has the possibility of getting around GPL licenses for the RIP

Current Linux Printing Pieces (continued)

foomatic db

- database of printers that can be used by backend and the spooler
- can create PPD files on-the-fly

foomatic filter

- another RIP, though the maintainer (Till) recommends OpenPrinting Vector