

# linuxprinting.org and Foomatic

## The Current Standard for Printer Driver Integration and Capabilities Handling

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Linux  
Printing.org

# Summary

- What is Foomatic?
- How did Foomatic emerge?
- How does Foomatic work?
- What is planned for the future?



# What is Foomatic?

- Foomatic: Universal Printing Infrastructure
  - *Database* about how printers are supported by free software
  - *Most complete database*: Lists more than 240 free drivers and more than 1000 printers.
  - Contains also information of *how the drivers are executed* (Command line, options)
  - Easy setup of printers under all spoolers



# What is Foomatic

- *PPD file generator* for all free printing systems (CUPS, PPR, PDQ, LPD, GNUlpr, LPRng, CPS, no spooler)
- User has *access to all the driver's options* when printing
- *Scripts* for administration/printing with the *same interface for all spoolers*
- *Inofficial standard* used by Mandrake, Conectiva, Red Hat, SuSE, Debian, KDE Print, ...



# How did Foomatic emerge?

- Foomatic: A Short History
  - Started 1998 by Grant Taylor, author of the Printing HOWTO
  - *CUPS-O-Matic* In early 2000, shortly after first CUPS release, later *PDQ-O-Matic*
  - In August 2000 I started at MandrakeSoft to switch *Mandrake 7.2* to *CUPS* as the first distro.
  - To not loose printer support in Mandrake 7.2, I entered the execution details of all drivers.
  - Since August 2001 I am project leader.



# How does Foomatic work?

- *XML-Database* consisting of entries for
  - *Printers*: Contains make, model, comments, support quality, ...
  - *Drivers*: Contains name, type, command line prototype, list of supported printers, ...
  - *Options*: Contains name, type, possible settings, for what printers/drivers, what to insert into command line/print job
- From this is derived which drivers with which options support a printer



# How does Foomatic work?

## Printers

**Printer:**  
**HP LaserJet 4**

PCL5, 600 dpi max., laser

ljet4: Resolution 600 dpi, Copies  
gimp-print: Resolution 600 dpi,  
Copies

**Printer:**  
**HP LaserJet 2100**

PCL5, PCL6, 1200 dpi max., laser

ljet4: Resolution 600 dpi, Copies  
gimp-print: Resolution 600 dpi,  
Copies  
pxlmono: Resolution 600/1200 dpi,  
Copies

**Printer:**  
**Epson EPL-5900**

PCL5, PCL6, 1200 dpi max., laser

ljet4: Resolution 600 dpi  
gimp-print: Resolution 600 dpi  
pxlmono: Resolution 600/1200 dpi

**Printer:**  
**Epson Stylus C80**

ESC/P 2, 2880x1440 dpi max., inkjet

gimp-print: Resolution 720 dpi

## Drivers

**Driver: ljet4**

PCL5, 600 dpi max.

Printers:  
HP LaserJet 4  
HP LaserJet 2100  
Epson EPL-5900  
...

**Driver: pxlmono**

PCL6, 1200 dpi max.

Printers:  
HP LaserJet 2100  
Epson EPL-5900  
...

**Driver: gimp-print**

Various lang. & resolutions

Printers:  
HP LaserJet 4  
HP LaserJet 2100  
Epson EPL-5900  
Epson Stylus C80  
...

## Options

**Option: Resolution**

Drivers:  
ljet4, pxlmono, gimp-print

Values:

- **600 dpi**  
{ljet4, pxlmono,  
gimp-print *only with*  
HP LaserJet 4, 2100,  
Epson EPL-5900}
- **1200 dpi**  
(pxlmono)
- **720 dpi**  
(Epson Stylus C80)
- ...

**Option: Copies (PJM)**

Printers:  
HP LaserJet 4, 2100

Values: Numbers 1-999



# How does Foomatic work?

- This data forms the *pages of linuxprinting.org*
- The same data is used to generate *PPD files*:
  - The user chooses *printer and driver*
  - An Adobe-compliant *PPD file* for the printer/driver combo is made
  - The user sets up a *print queue* with this file and the *universal Foomatic filter* “**foomatic-rip**”





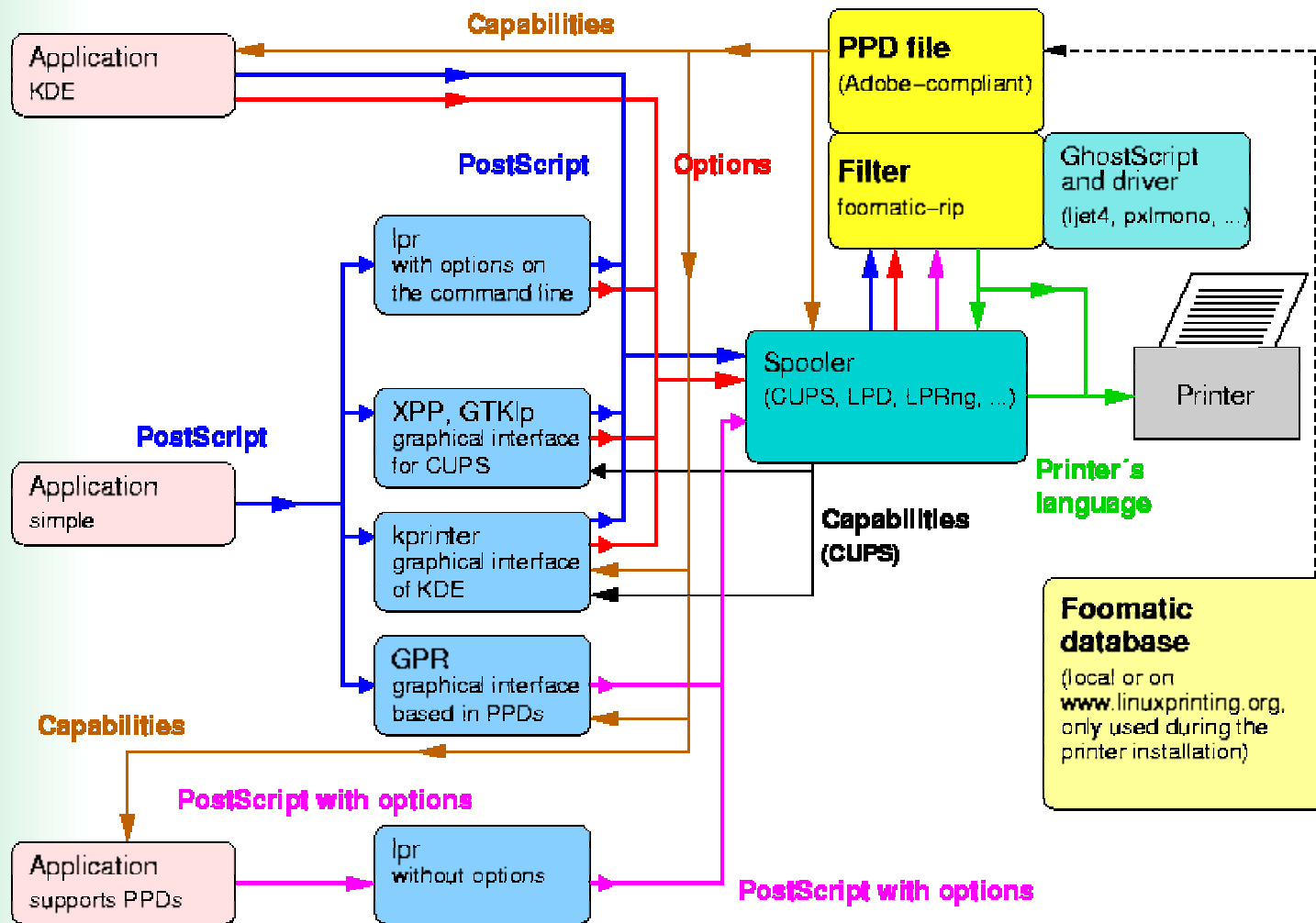
# How does Foomatic work?

- Foomatic filter
  - “`foomatic-rip`” filter converts *PostScript* to the printer's *native language*.
  - Filter is *Perl* script, reads *printer capabilities* from PPD file without libraries
  - Filter receives *user's settings* via spooler or embedded in the job's *PostScript*
  - Filter sets up *GhostScript command line* from info of the config file and the user
  - Also inserts settings in job (PS, PJL)



# How does Foomatic work?

## Data Flow when Printing with Foomatic



# How does Foomatic work?

- Interaction with applications/frontends
  - Applications produce *PostScript* to print
  - Options can be set on the *command line*: “**lpr -P lj -o Resolution=1200 file.ps**”
  - KDE Applications use *GUI “kprinter”* which gets capability info from *Foomatic PPD* or *CUPS*
  - Other *GUIs*: XPP, GTKlp (CUPS), GPR (PPD)
  - The PPD files are also used for PPD-aware apps (as OpenOffice.org) or Windows/Mac clients.



# How does Foomatic work?

- Same interface for administration/usage of every spooler
  - **foomatic-configure**
    - Administration of *print queues* (add, modify, copy, ...)
    - Adding queues with one command line under any spooler
  - **foomatic-printjob**
    - Tool for *printing and managing jobs*
    - Unifies functionality of “**lpr**”, “**lpq**”, “**lprm**”, “**lpc**” also for spoolers without such commands



# What is planned for the future?

- Printer/driver classes
  - Classes contain printers or drivers with common features (as all A3 printers, all PCL5, ...)
  - Option/choice constraints can specify classes
  - Class XML files contain common info as printer language, comment text snippets, ...
- Option conflict handling (as duplex on transparencies)
- PickMany option types



# What is planned for the future?

- “pstoedit” driver entry for HP-GL/2 plotters
- Links to PPD/UPDF files in database, hosting these files on [linuxprinting.org](http://linuxprinting.org)
  - Free HP and Kyocera PPDs already available.
- Automatic Foomatic data generation for UPDF files with Omni
- GUI for Foomatic tools
- Printer auto-detection
- Auto-config of OpenOffice.org, GIMP, ...



# Final words

Foomatic ...

- ... is the most complete printer/driver compatibility database
- ... generates Adobe-compliant PPD files
- ... has a universal filter for all spoolers
- ... provides tools for printer administration and printing for all free spoolers

So Foomatic is already one of the best solutions for printer/driver/spooler integration, but ...



# Final words

- Currently, 90 % of the work on Foomatic is done by me
- More developers needed to implement important, but still missing features
- Database must be kept up-to-date with new printer models
- Publishing of PPDs/UPDFs as free software by printer manufacturers needed, to add these files to [linuxprinting.org](http://linuxprinting.org)

