

Printing

CIS 68C1-01
Lecture 10
Instructor: Mike Cappella

Printing

Two Flavors

- UNIX has two main flavors of printing
 - BSD-style
 - Red Hat, FreeBSD
 - Utilities: **lpr**, **lpc**, **lpd**, **lprm**, etc.
 - Provides remote printing
 - System V style
 - Solaris, HP-UX
 - Utilities: **lp**, **lpadmin**, **lpsched**, etc.
 - Does not have remote printing capabilities

Printing

Terminology

- Spooler
 - Print jobs are sent to a spooler to be printed
 - Handles queuing of jobs
- PDL – Page Description Language
 - Language used to communicate with printer how a document is to be printed
- RIP - Raster Image Processor
 - Converts PDL documents to bitmaps for the printer
- Bitmap
 - Rows / columns of dots that defines the actual image

Printing

Terminology

- Filters
 - Print jobs pass through these programs on the way to the print spooler
- PostScript
 - Default standard PDL, developed by Adobe
 - Commonly used on UNIX
- PCL
 - PDL used by HP printers, developed by HP
 - Commonly used on w/PCs

Printing

□ Printer Types

■ Physical Connection

- Serial
 - Setup requires knowing baud rates, flags, etc.
- Parallel
 - Easier to configure and faster than serial printers
 - Found generally only on PCs
 - /dev/parport0
- Network
 - Built-in network card, printer attaches to network
 - Many include a built-in **lpd** server

Printing

□ Printer Types

■ Data Format

- PostScript, PCL, text, or others such as WinPrinter
- PostScript Printers
 - Work well with UNIX
 - UNIX uses the PostScript PDL to print
- Non-PostScript Printers
 - Many inkjets, cheap laser printers, old line printers, etc. do not support PostScript
 - Require translation programs from PostScript -> printer's data format

Printing

□ BSD-Style Printing

- De-facto standard
- Works well locally or over a network
- Supports sharing printers and spoolers
- Programs that print end up calling use **lpr**
- Components
 - lpr
 - User program used to submit a print job to a printer
 - lpd
 - Printer daemon accepts jobs, processes jobs, and transfers jobs to printers

Printing

□ BSD-Style Printing

■ Components

- /etc/printcap
 - Printer configuration file, read by **lpd**
- lprm
 - Removes print jobs from spool area
- lpc
 - Administrative printer control program
- lpq
 - Shows queue of current print jobs
- lpunlock
 - Red Hat print server unlock script

Printing

□ BSD-Style Printing

- Selecting a printer to use
 - Default printer name is **lp**
 - **PRINTER** environment variable
 - Specifies name of printer to use for printing
 - **-Pprintername** Option
 - Option accepted by printer utilities such as **lpr**, **lprm**, **lpq**, and **lpc** to specify printer
 - Overrides **PRINTER** environment variable

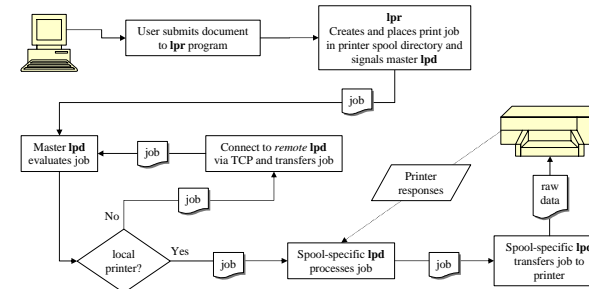
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□ The Printing Process



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□ Configuration – Red Hat's **printtool**

- The graphical **printtool** makes printer setup and configuration much easier
- Vendor-specific
 - Not available in many other UNIX systems
- Modifies the raw database **/etc/printcap**
- Creates necessary spool directories and files
- Restarts **lpd** when requested
- Only does basic printer setup
 - More complex needs require manual setup

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□ Configuration - **/etc/printcap**

- Database used by **lpr** & friends to configure printers
- **printtool** requires that **printcap** is in a precise format
 - Caution when editing by hand

```
##PRINTTOOL3## LOCAL
lp1|laserwriter|My Printer:\
    :sd=/var/spool/lpd/lp1:\
    :mx#0:\
    :sh:\
    :lp=/dev/parport0:
##PRINTTOOL3## REMOTE
rlp|remotelp|My Remote Printer:\
    :sd=/var/spool/lpd/rlp:\
    :mx#0:\
    :sh:\
    :rm=myprinthost:\
    :rp=remotelp:\
    :lpd_bounce=true:
```

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- LPRng

- Red Hat replaces the BSD package with **LPRng**
- Enhanced, replacement print / spooler package
- BSD-based
 - Also has most important System V commands
- Backwards compatible
- Features
 - Increased security
 - Better diagnostics
 - System V derived queue management
 - Commands have additional functionality and options
 - The **lpc** control utility is network-aware