

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

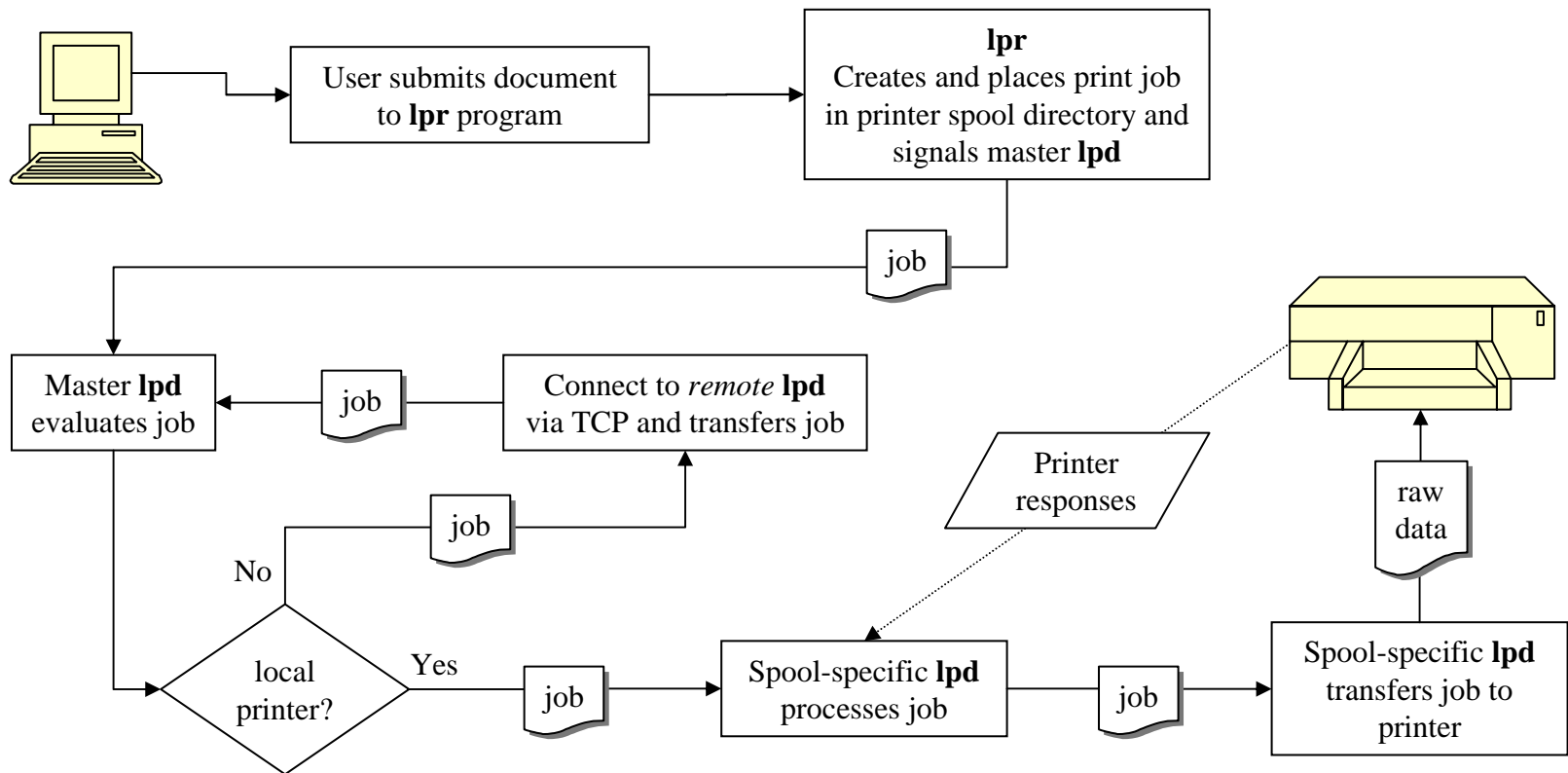
□ BSD-Style Printing

■ 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

Printing

□ The Printing Process



Printing

- 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

Printing

- 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/parpart0:
##PRINTTOOL3## REMOTE
rlp|remotelp|My Remote Printer:\
    :sd=/var/spool/lpd/rlp:\
    :mx#0:\
    :sh:\
    :rm=myprinthead:\
    :rp=remotelp:\
    :lpd_bounce=true:
```

□ 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