



CERN PRINT Service Status Update

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Agenda

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- ◆ **Protocols**
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Some Figures

- ◆ **1200 Printers**

HP, Apple, QMS, Tektronix, Xerox...

+ Impact printers, remote, ...

- ◆ **Protocols**

Appletalk, TCP port 9100, Appsocket...

- ◆ **5000 Registered Unix users**

- ◆ **Over 3000 Linux/Unix boxes**

Mostly Linux and Sun, but still HP, Digital, IBM, SGI,...

- ◆ **Over 1000 X-terminals**

- ◆ **Over 3000 PCs running Windows**

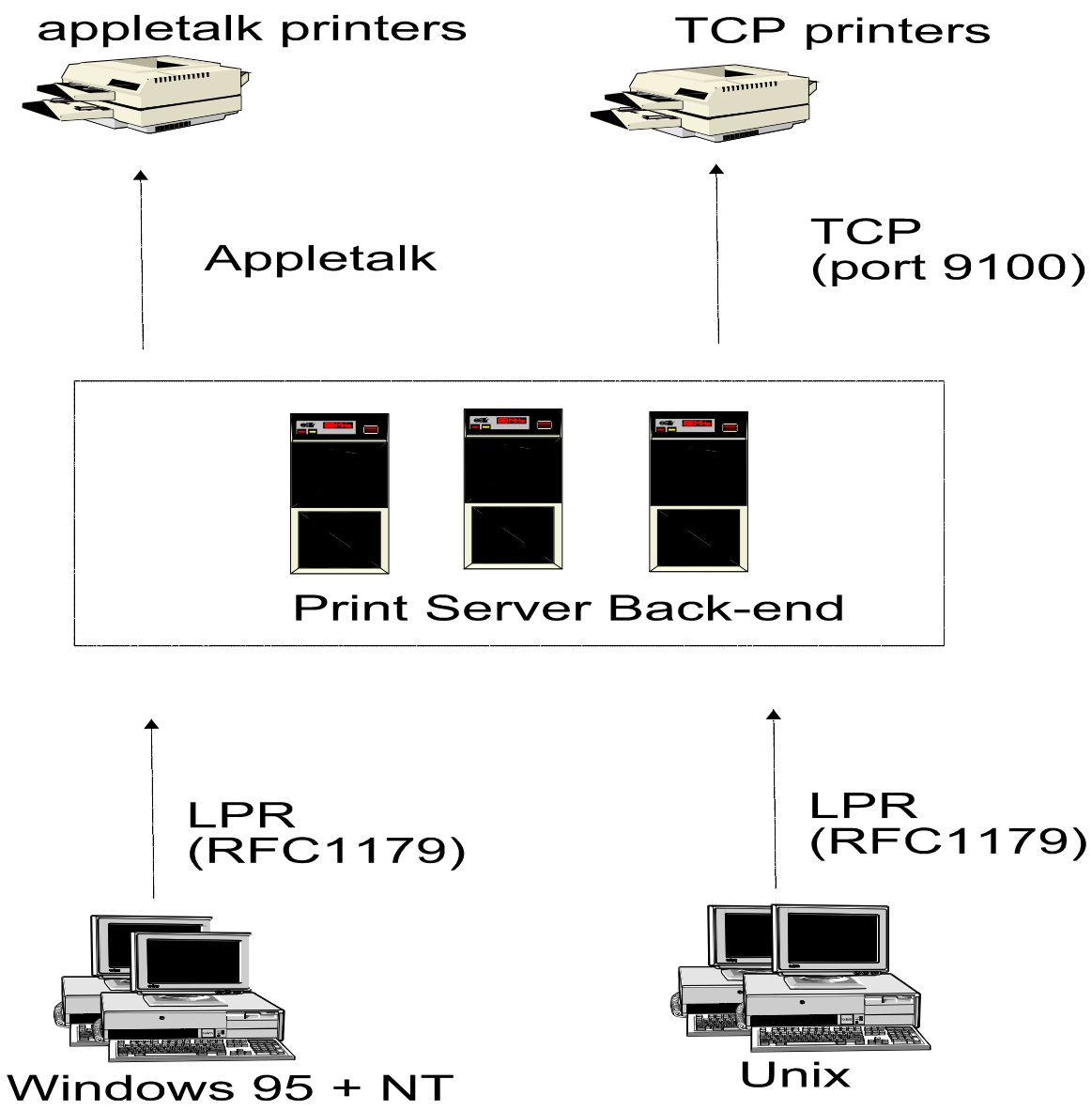
Mostly Windows 2000, but also 95 and NT



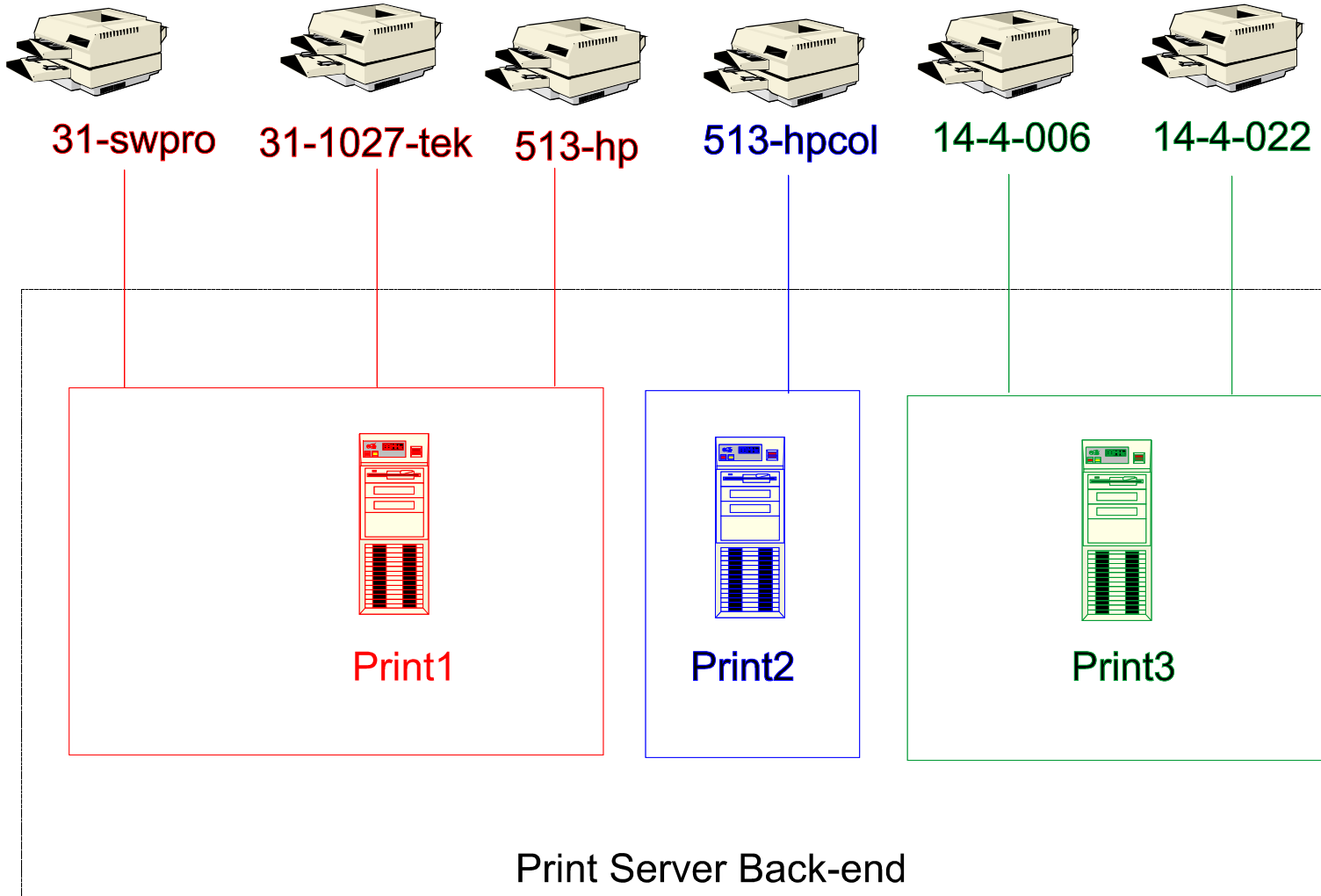
Characteristics of the PRINT Architecture

- ◆ **Support both Windows and Unix clients**
- ◆ **Unify server back-end for Windows and Unix**
- ◆ **No single points of failure**
- ◆ **Scalable**
- ◆ **“Commodity” server HW**
- ◆ **Single protocol for server back-end**
 - **RFC1179 (LPR)**

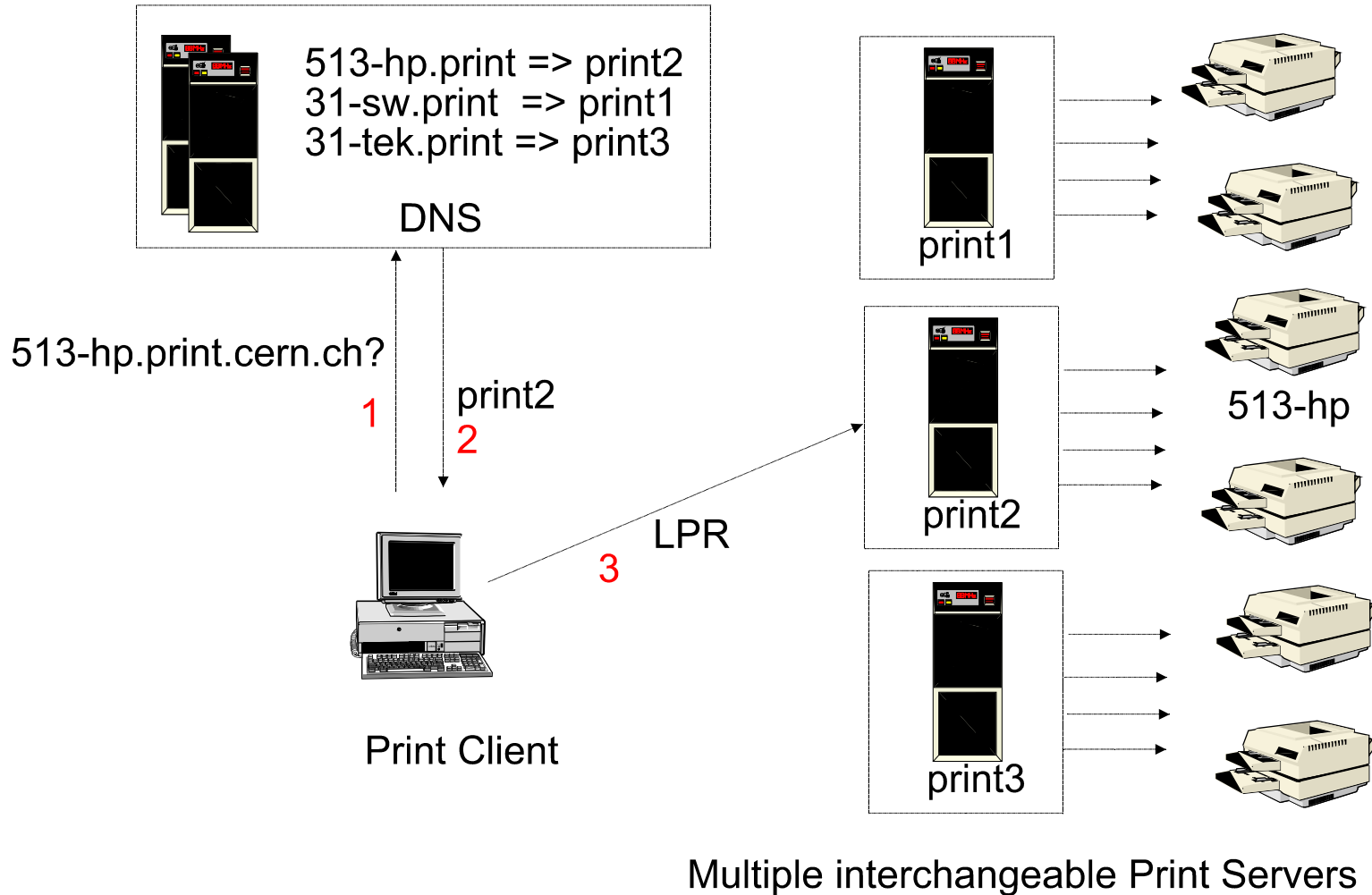
Protocols



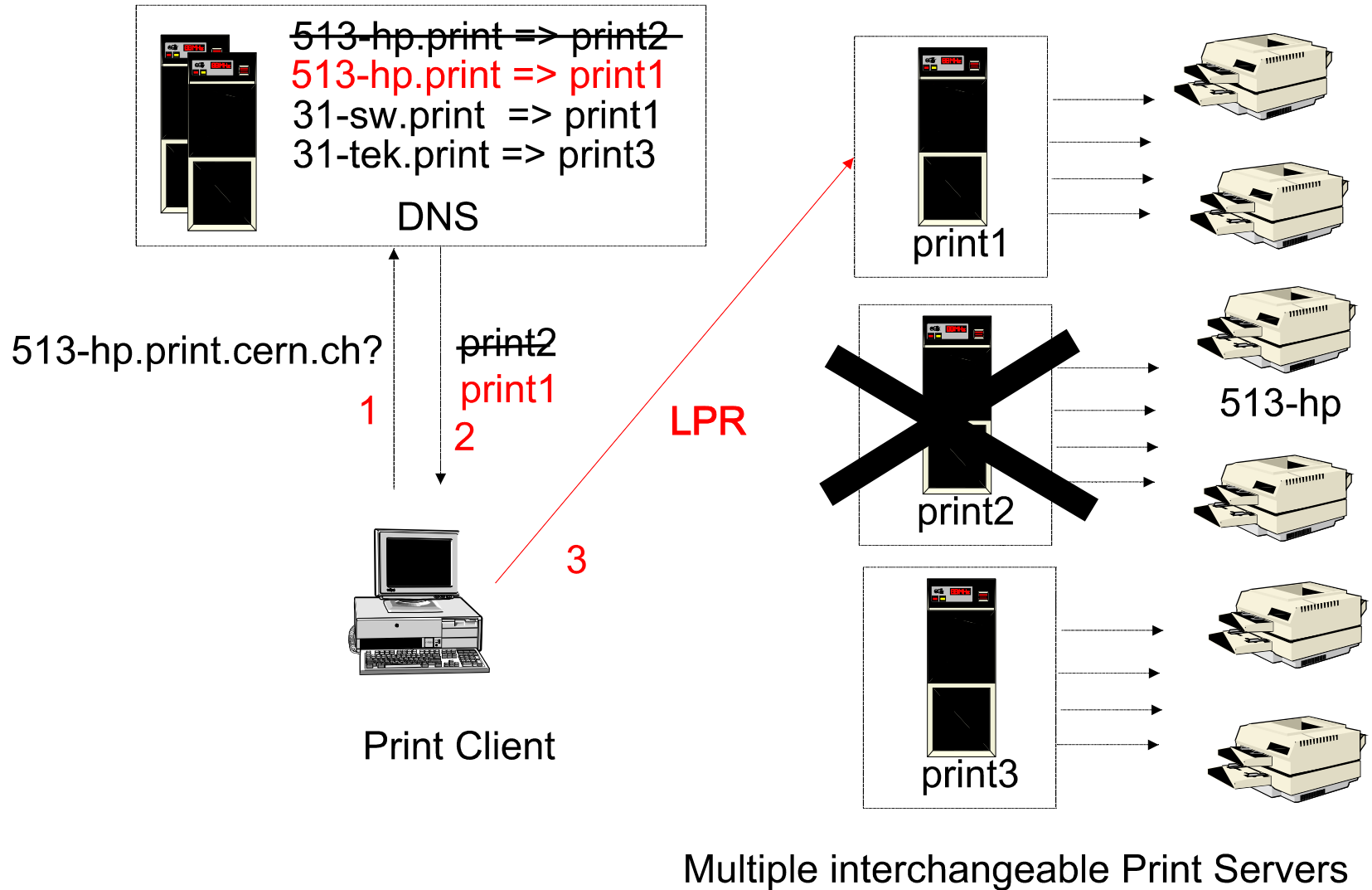
Single Queue per Printer



Broker Architecture



Recovery





Current Implementation

- ◆ **Array of 3 DEC Prioris servers with Pentium Pro 200MHz**
- ◆ **Clustering mechanism**
- ◆ **Each server running the Linux OS**
 - LPRng spooler 3.5.2
 - CAP V198 + DDP Linux module for Appletalk + CERN patches
 - Powerful set of filters: papif, CTI-ifhp, qfilter... modified for integration and device support
 - Accounting, banner programs
 - Automated kickstart + SUE server installation
 - Configuration management
- ◆ **Printer Wizard: CERN Windows print client**
- ◆ **LPRng Unix print clients modified for clustering**

Filter Architecture

Apsfilter

Common behaviour
tray selection
backwards compatibility

Papif

CTI-ifhp

Phaserif

Qfilter



Windows Print Client

NICE Printer Wizard

Installed Printers

Default Printer:

Printer Name	Driver Name	Status	Port / Server
6-1-012-PS	HP LaserJet 4000 Series PS	Pending	PRINT1
6-1-012-CP	Tektronix Phaser 550		PRINT1
354-MCR	HP LaserJet 4000 Series PS		PRINT1
10-2009-HP	HP LaserJet 4V/4MV PostScript		PRINT1
6-PSOP	HP LaserJet 5/5M PostScript		PRINT1

Available Network Printers

Printer Name	Printer Model	Printer Type
6-1-012-CP	Tektronix Phaser 550	PostScript
6-1-012-PS	HP LaserJet 4000 Series PS	PostScript
6-PSDL	Apple LaserWriter II NTX v47.0	PostScript
6-PSOP	HP LaserJet 5/5M PostScript	PostScript
6-R-002-HPPS	HP LaserJet III Si PostScript v5...	PostScript
8-1006-MAINT	Apple LaserWriter Pro 630	PostScript
8-PSCO	HP LaserJet III Si PostScript v5...	PostScript
9-1011-PSCA	HP LaserJet III Si PostScript v5...	PostScript
9-PSHI	Apple LaserWriter Pro 630	PostScript
9-R-018-CP	QMS ColorScript 100 Model 10...	PostScript Color A4

Printer Types : Building :

ALL	1
LaserJet	2
LaserJet A3	3
Plotter (HPGL)	4
Plotter (HPGL) A0	5
Plotter (HPGL) A1	6
Plotter (HPGL) A3	7
Plotter (HPGL2)	8
PostScript	9
PostScript A3	10
PostScript A3/A4	11
PostScript Color A3	13
PostScript Color A4	14
Undefined	15
	16
	17



Unix Print Clients

- ◆ **From LPRng**
- ◆ **Modified to support CERN DNS print tree**
 - For print server addressing

-P printername => -P printername@printername.print.cern.ch

- ◆ **Lightweight: no spooling configuration**
- ◆ **“Drop in” replacements of lpr and lp**
- ◆ **xprint Backwards compatibility interface implemented**
- ◆ **Distributed from ASIS repository**



Status

- ◆ **Since 1998**
- ◆ **Massive printer reconfiguration done**
- ◆ **Move to IP protocols**
- ◆ **Last Novel server (IPX for Netports) gone on 2001**
- ◆ **Appletalk still present (25% printers driven)**
 - Expensive to maintain
 - Next to go

- ◆ **Full Windows and Linux/Unix population using the system**
- ◆ **Over 7000 print jobs per day**
- ◆ **Currently running on three servers**



Print Client Development: Proposal for RedHat 7.2

Proposed by ADC group for RH 7.2 Beta2:

- ◆ **For xprint interface use xprint Perl Implementation**
 - Originally for Windows and VMS support
- ◆ **For lpr and lp interface use LPRng client as distributed from RedHat**
 - With /etc/printcap line that allows generic DNS mapping of printer to server
- ◆ **Pros:**
 - Same Client for local printers
 - Unmodified lpr and lp from LPng
- ◆ **Cons:**
 - Depend on /etc/printcap entry
 - Looses accounting feature
 - Different than other architectures



Server Development

- ◆ **Server Renumbering**
 - As only 515 port required for external access for printing
 - Moving servers to outgoing only address range
- ◆ **Server Hardware Upgrade**
 - To dual PIII 1 GHz machines
- ◆ **Server Software Upgrade**
 - System from RedHat 5 to RedHat 7
 - Problem with Appletalk support
 - Either port CAP
 - Or modify filters to use Netatalk
 - LPRng to latest version
 - Ifhp filter to latest version
- ◆ **Configuration tested together with Brian Hess of Jlab**
 - Unfortunately no suite



Other Server Developments

- ◆ **PRINT server configuration synchronized distribution**
- ◆ **Cluster graphic control interface**
- ◆ **Printer monitoring interface**



Conclusions

- ◆ Linux, LPRng, CAP...
- ◆ **“Open Source” Software is**
 - Flexible
 - Reliable
- ◆ **It has allowed us to implement a scalable printing system very efficiently**
- ◆ **We seek collaboration with other interested sites to share development and maintenance on this area**