

# Linux Printing & Imaging

## A Presentation

to

**BLU**

By

Vince McHugh

**NECS \ Canon**

# Two Parts of this presentation

Printing

CUPS

*Documents output from your Linux Computer in the format You actually want!!!  
Double-sided & Stapled  
Landscape or Portrait*

Imaging

Scanning

*Taking "hard copy" documents and scanning them to your Linux computer as  
Tiff, Mtiff or PDFs*

# Part One: Linux Printing

**"Unix Printing has been a mess for the last thirty years"**

Most Unix/Linux Users and Admins have been satisfied with lp and lpr **IF** it prints.

Unix Sys Admins have often felt that **Printing is too much trouble.**

The attitude is usually **"just be thankful that you can print at all".**

Q. What do you think of when you hear  
Unix/Linux Printing?

If it's *noisy* impact printers  
and  
Green Bar Paper  
it's time to take a look at  
modern Linux / Unix Printing !

# Why CUPS ???

With the CUPS printing system Linux users can have all the Printing functions that their Windows peers have.

**The ability to do:** Double Sided Printing  
To choose Landscape or Portrait  
Staple in multiple positions  
choose paper size and/or tray  
*even* make booklets  
High speed B&W printing (20-105+ppm)  
High end Color Printing

You can even *pre-define* virtual printers with specific printing characteristics and have all these features from  
The Command Line!

# What Is CUPS ?

The **C**ommon **U**nix **P**rinting **S**ystem

[www.cups.org](http://www.cups.org)

GPL Software developed by

**E**asy **S**oftware **P**roducts

Included in many Linux Distros  
based on the IPP print standard

# CUPS works with PPDs

**PPDs = Printer page descriptions**

**A PPD tells CUPS what abilities your printer has.**

**Double Sided? Staple? Reduce / Enlarge?**

**Q. Where do I find a PPD for my printer?**

**PPDs installed alongside your CUPS installation:**

**These will enable you to print to several hundred different printer models, but will not give you access to specific capacities of the models (duplex, input tray selection, smaller margins,...)**

### **PPDs from a Printer Manufacturer:**



Those are distributed alongside a PostScript capable printer. Originally they were intended for MacOS or MS Windows platforms only. CUPS can use them without a change.

**Normally, the Windows NT versions work flawlessly with CUPS.**

You get them from **the manufacturer's website** or from a MS Windows PC **PostScript driver disk** for your printer.

Put a copy into your **/usr/share/cups/model/** directory to make it available for installation through the web interface.

### **PPDs from Easy Software Products: the creators of CUPS**

Those are commercially sold and supported drivers that are supplied  
(and on  ESP PrintPro  
.com/printpro/">http://w.com/printpro/

## **PPDs from Linuxprinting.org:**

**<http://www.linuxprinting.org/>**

---

## **PPDs from the Gimp-Print project:**

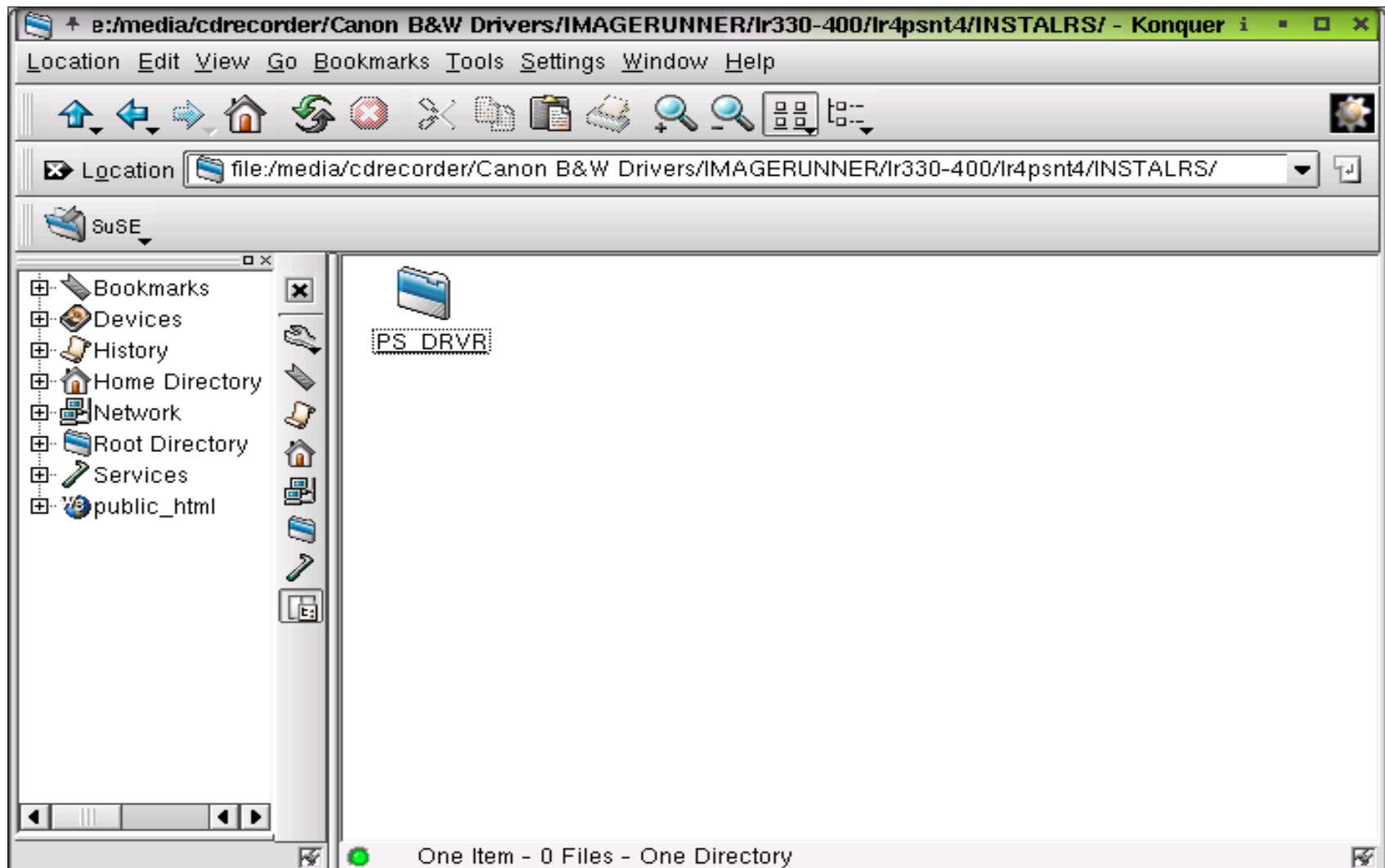
**Specific PPDs for around 120 different models of Canon, Epson, HP and Lexmark color printers. The creators of CUPS are founders and still part of the development team of gimp-print project.**

## **Recommendation:**

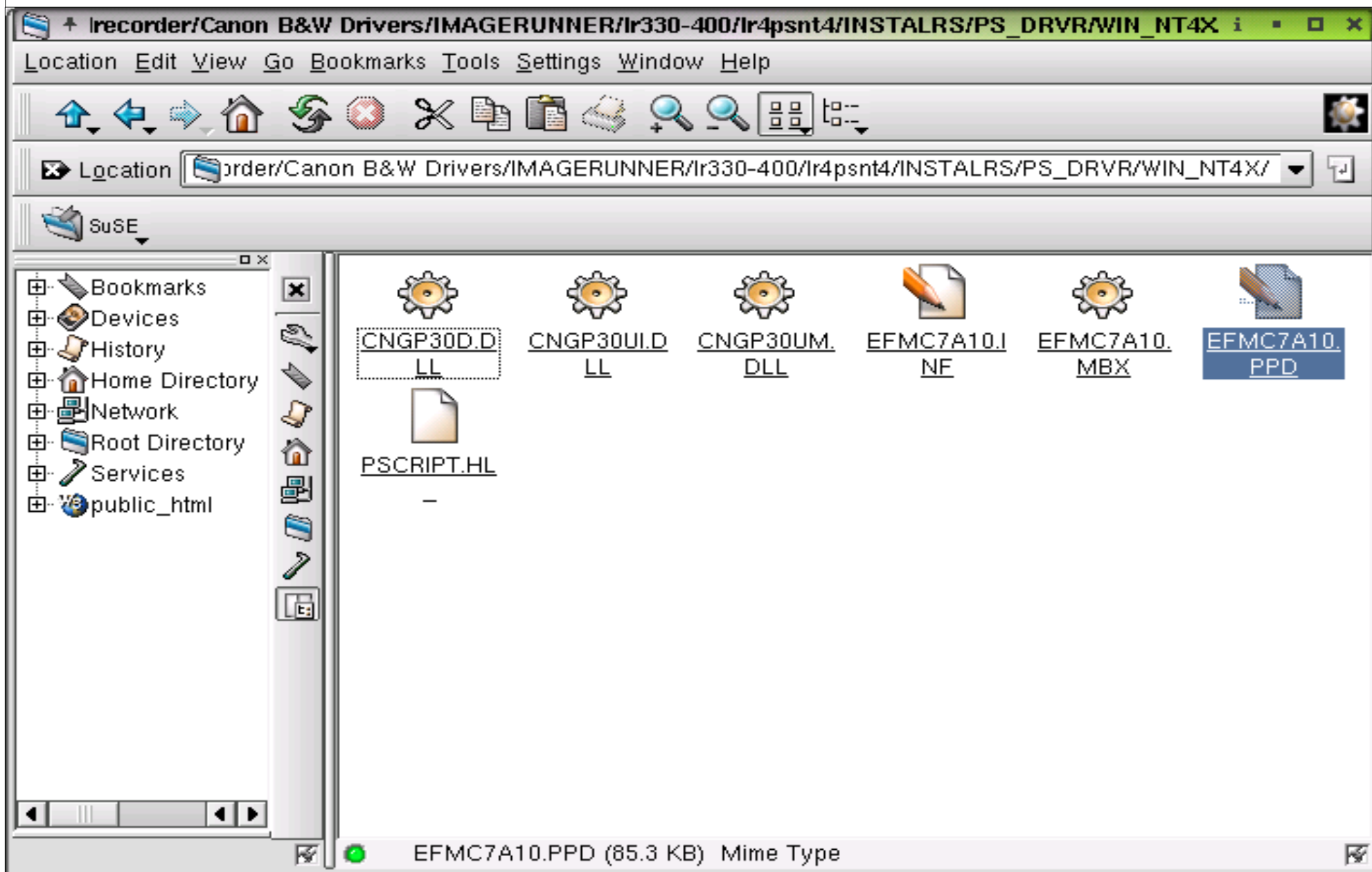
**PostScript printers should be installed using the vendor PPD for that model (best to use the one targeted for Windows NT).**

# How to get a PPD

## Browse your Windows Postscript Printer driver CD ROM



You may need to "drill down" or search the Windows Print driver CD for a ppd file. Once you have it copy and paste it to </usr/share/cups/model/>



You want to put the new PPD in the specific manufactures directory  
(ie: Canon, HP, Lexmark)

**Note:** You will need to **re-start the CUPS daemon** after you add PPDs or  
you will **NOT** see them when you go to the WEB admin tool.

# Restarting the CUPS Server

Once you have made a change to a configuration file you need to restart the CUPS server by **sending it a HUP signal** or using the supplied **initialization script**.

The CUPS distributions install the script in the `init.d` directory with the name `cups`. The location varies based upon the operating system:

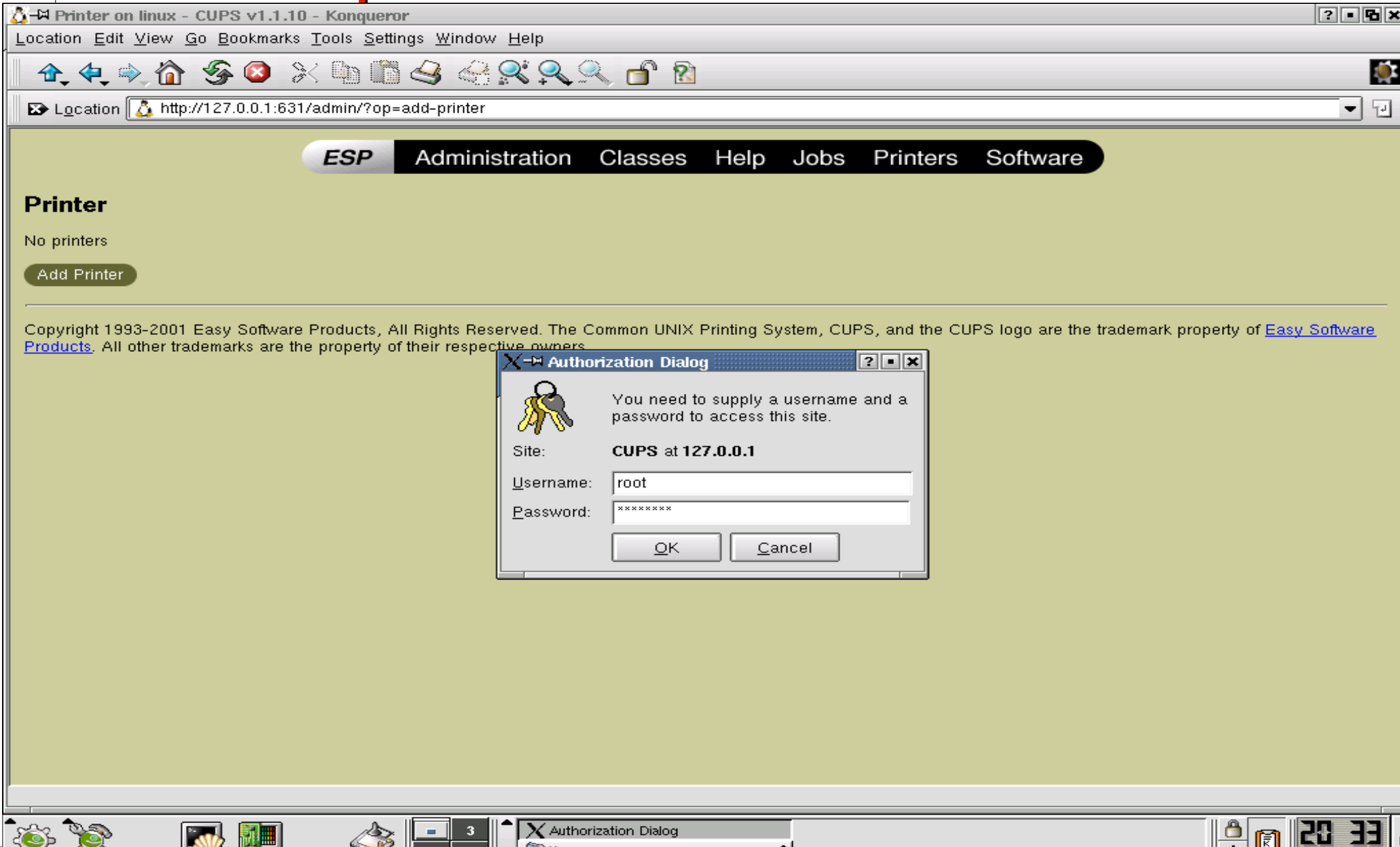
```
/etc/rc.d/init.d/cups restart ENTER
```

```
/etc/init.d/cups restart ENTER
```

```
/sbin/init.d/cups restart ENTER
```

Now start your favorite web browser and go to **127.0.0.1:631**

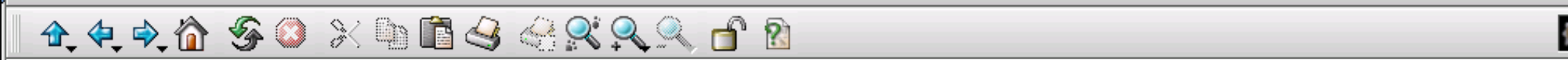
**There are other front end managers for CUPS,  
but for this presentation we will focus on the WEB tool**



The screenshot shows a web browser window titled "Printer on linux - CUPS v1.1.10 - Konqueror". The address bar displays "http://127.0.0.1:631/admin/?op=add-printer". The main content area features a navigation menu with "ESP", "Administration", "Classes", "Help", "Jobs", "Printers", and "Software". Below the menu, the text "Printer" is followed by "No printers" and an "Add Printer" button. At the bottom of the page, a copyright notice reads: "Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners."

An "Authorization Dialog" box is overlaid on the page. It contains the following text and fields:

- Icon: A key icon.
- Message: "You need to supply a username and a password to access this site."
- Site: "CUPS at 127.0.0.1"
- Username: "root" (input field)
- Password: "\*\*\*\*\*" (input field)
- Buttons: "OK" and "Cancel"



## Admin

### Add New Printer

Name:	<input type="text" value="Sales1"/>
Location:	<input type="text" value="1st Floor Sales Office"/>
Description:	<input type="text" value="Canon IR400 Copier Printer"/>

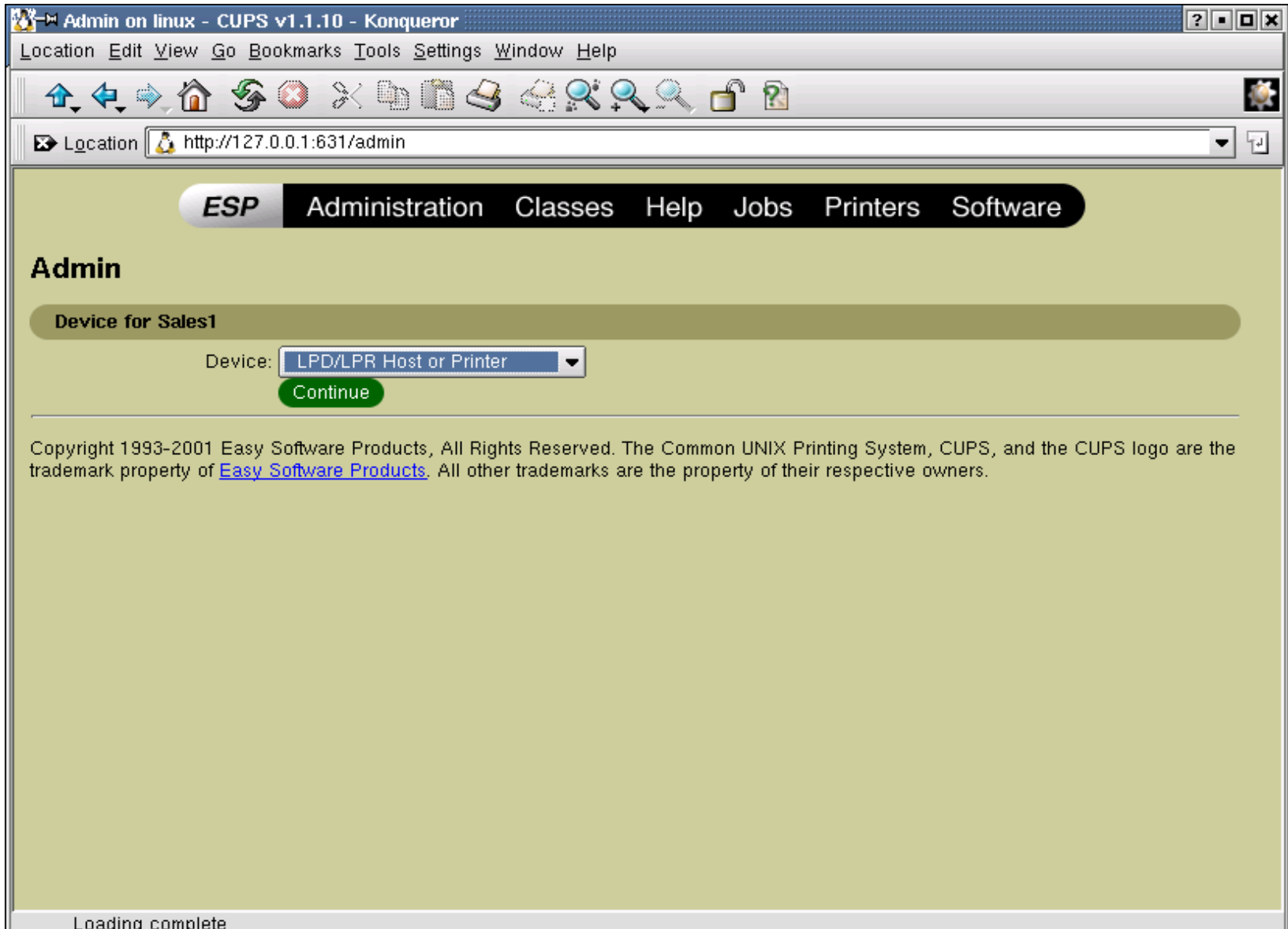
[Continue](#)

Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners.

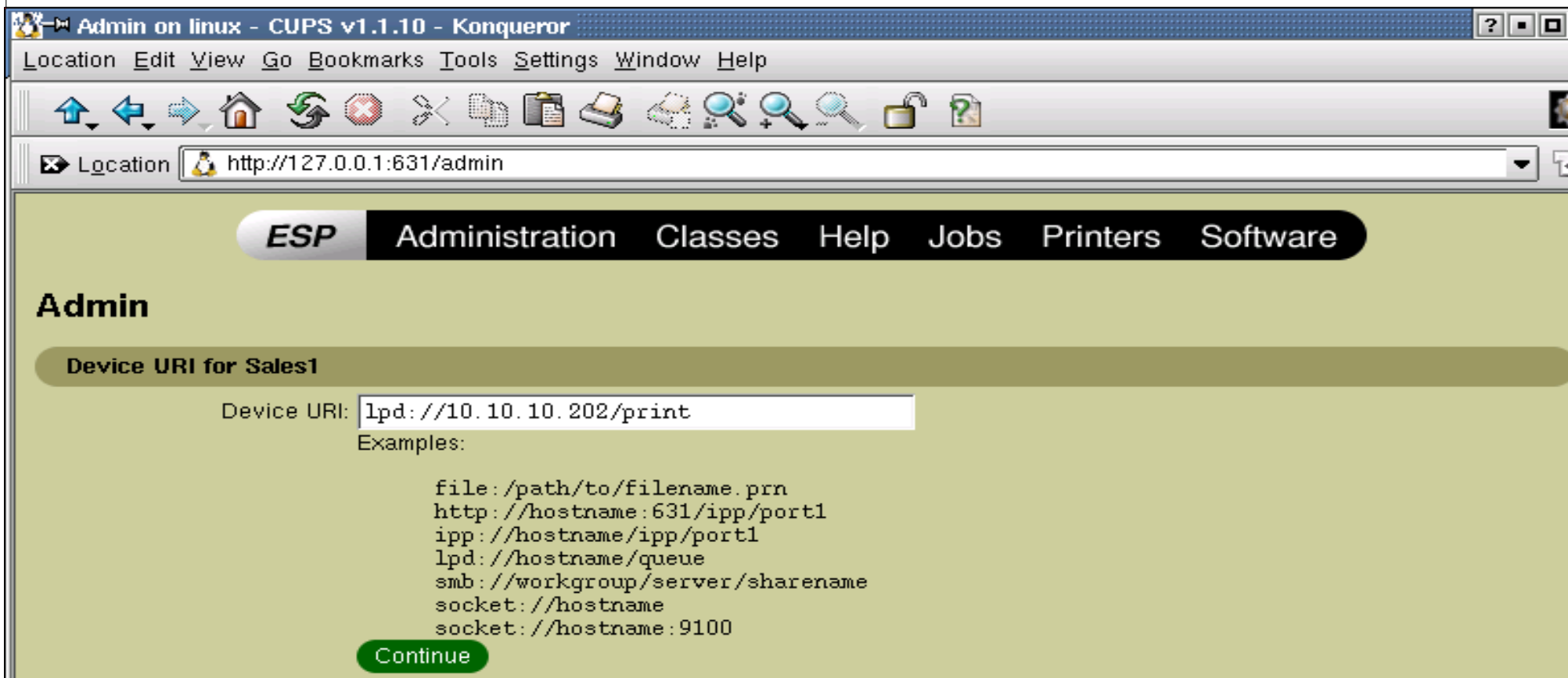


Here is where you set up the "port" or type of printing.

You can choose LPR, IPP, SMB, HP JetDirect, Parallel, or Serial printing.



# There are even examples of the syntax for different types of printing ports



The screenshot shows a web browser window titled "Admin on linux - CUPS v1.1.10 - Konqueror". The address bar contains "http://127.0.0.1:631/admin". The main content area has a navigation bar with "ESP" and "Administration Classes Help Jobs Printers Software". Below this is a section titled "Admin" with a sub-section "Device URI for Sales1". A text input field for "Device URI:" contains "lpd://10.10.10.202/print". Below the input field, the word "Examples:" is followed by a list of URI schemes: file://path/to/filename.prn, http://hostname:631/ipp/port1, ipp://hostname/ipp/port1, lpd://hostname/queue, smb://workgroup/server/sharename, socket://hostname, and socket://hostname:9100. A green "Continue" button is located below the examples.

ESP Administration Classes Help Jobs Printers Software

## Admin

Device URI for Sales1

Device URI:

Examples:

- file://path/to/filename.prn
- http://hostname:631/ipp/port1
- ipp://hostname/ipp/port1
- lpd://hostname/queue
- smb://workgroup/server/sharename
- socket://hostname
- socket://hostname:9100

[Continue](#)

Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners.



# Admin

## Model/Driver for Sales1

Make:

- Raw
- ALPS
- APOLLO
- APPLE
- AVERY
- BROTHER
- C.ITOH
- CANON**
- CITIZEN
- COMPAQ

**Continue**

Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners.

**This is where we find the Manufacturers PPD that we added earlier**

**Note: If you don't see your PPD that you added you probably forgot to re-start CUPS**

Admin on linux - CUPS v1.1.10 - Konqueror

Location Edit View Go Bookmarks Tools Settings Window Help

Location http://127.0.0.1:631/admin

ESP Administration Classes Help Jobs Printers Software

### Admin

Model/Driver for sales1

Model:

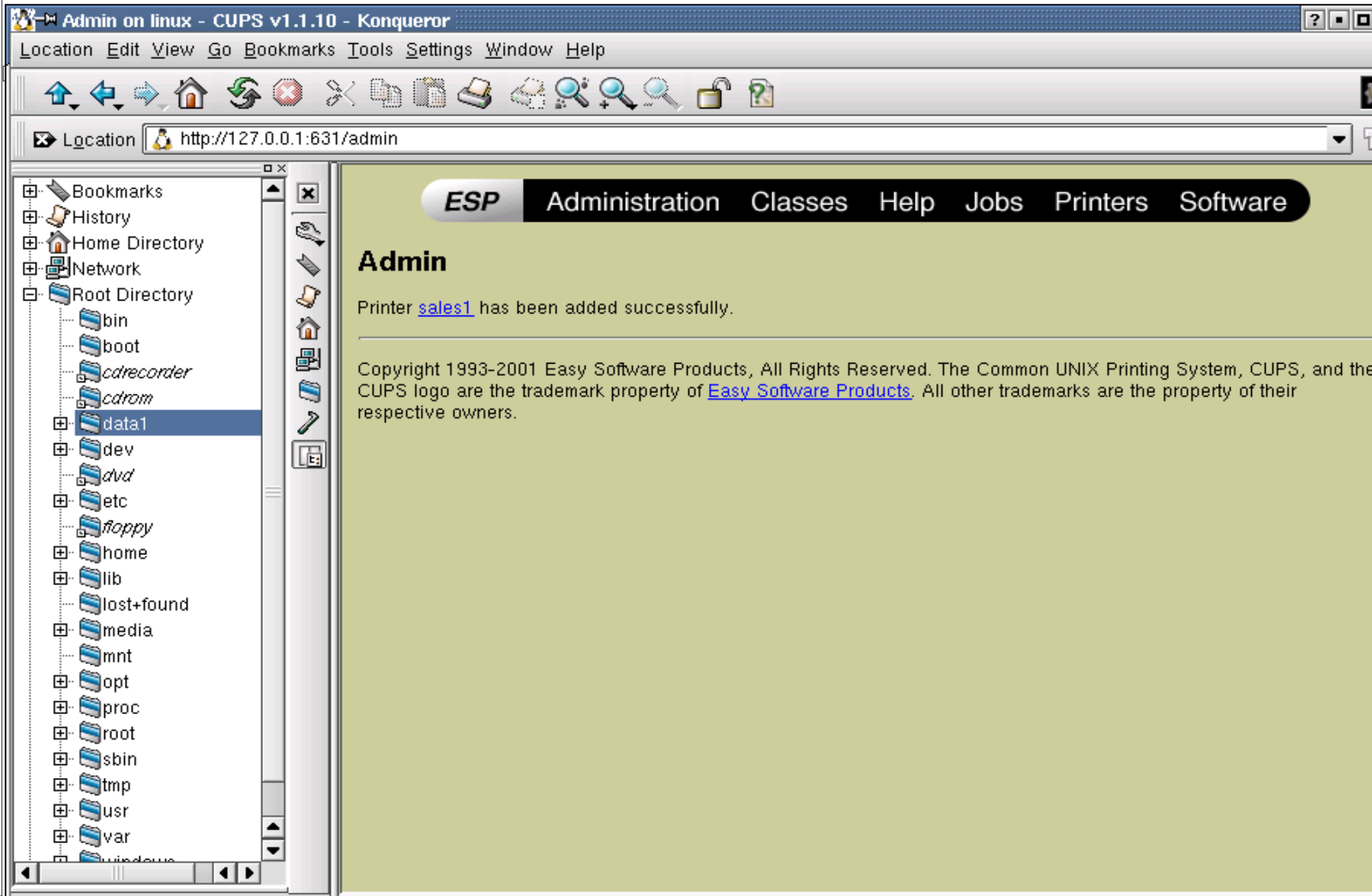
- Canon BJC 7100, Foomatic + bjc000 (en)
- Canon BJC-7100, Foomatic + stp-4.0 (en)
- Canon BJC-8200, Foomatic + stp-4.0 (en)
- Canon GP 335, Foomatic + ljet4 (en)
- Canon GP 335, Foomatic + Postscript (en)
- Canon GP 405, Foomatic + Postscript (en)
- Canon IR330-400 PS Print Server Ver 1.0 (en)**
- Canon LASER SHOT LBP-730PS 2-font (en)
- Canon LASER SHOT LBP-730PS 5-font (en)
- Canon LBP 1260PS v2013.108 (en)
- Canon LBP-4 PS-2 v51.4 (en)

Continue

Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners.

# The WEB tool is very intuitive

You could even have your "less technical" people manage your printers



# Easy Printer Set up & Management

The screenshot shows a web browser window titled "Printer on vmchugh-lnx - CUPS v1.1.10 - Konqueror". The address bar shows "http://127.0.0.1:631/printers". The main content area lists four printers, each with a small icon, a title, a description, location, printer state, and device URI. Below each printer's details are several control buttons: "Print Test Page", "Stop Printer" (highlighted in red), "Reject Jobs", "Modify Printer", "Configure Printer", and "Delete Printer".

Printer Name	Description	Location	Printer State	Device URI	Control Buttons
<a href="#">Color650</a>	ColorPASS-Z650 Color Server	Demo Room	idle, accepting jobs.	http://CP_Z650:631/ipp/print	Print Test Page, Stop Printer, Reject Jobs, Modify Printer, Configure Printer, Delete Printer
<a href="#">ir105</a>	Canon iR105-M1 PS Ver 1.1	Demo Room	idle, accepting jobs.	smb://WORKGROUP_DR/IMAGEPASS-M1/print	Print Test Page, Stop Printer, Reject Jobs, Modify Printer, Configure Printer, Delete Printer
<a href="#">irC2050</a>	Canon iR C2000 series PS	Demo Room	idle, accepting jobs.	lpd:10.10.5.167/print	Print Test Page, Stop Printer, Reject Jobs, Modify Printer, Configure Printer, Delete Printer
<a href="#">sales1</a>	Canon iR330-400 PS Print Server Ver 1.0	1st Floor Sales Office	stopped, accepting jobs. "Paused"	lpd://10.10.10.202/print	Print Test Page, Start Printer, Reject Jobs, Modify Printer, Configure Printer, Delete Printer

Now we are ready to configure the printer and take advantage of our PPDs features.

Select **"Configure Printer"** to access the PPDs Features

Printer on linux - CUPS v1.1.10 - Konqueror

Location Edit View Go Bookmarks Tools Settings Window Help

Location <http://127.0.0.1:631/printers>

ESP Administration Classes Help Jobs Printers Software

## Printer

Default Destination: [sales1](#)

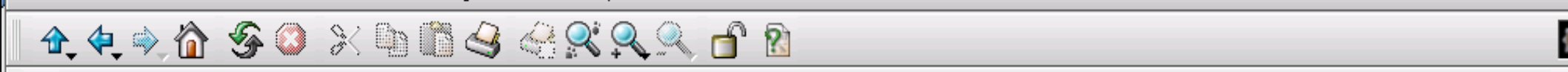
[sales1](#) **Canon iR330-400 PS Print Server Ver 1.0**

Description: Canon iR400 Copier Printer  
Location: 1st Floor Sales Office  
Printer State: idle, accepting jobs.  
Device URI: lpd://10.10.10.202/print

Print Test Page **Stop Printer** Reject Jobs Modify Printer Configure Printer  
Delete Printer

Add Printer

Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners.



Choose default options for sales1.

### Extra

2-Sided Printing: Long Edge Binding ▾  
Booklet: Off ▾  
Density: 5 ▾  
Destination: Printer ▾  
First Page Source: Job's Source ▾  
Landscape: Printer's default ▾  
Refine: On ▾  
Resolution: 600 DPI ▾  
Rotate 180: Printer's default ▾  
Sorter Mode: 1-Staple [Upper Left-L] ▾  
Toner Reduction:  Off  On

Continue

### General

Media Type: Plain Paper ▾  
Page Size: Letter ▾  
Paper Source: Auto ▾

Continue

### Options Installed

Cassette Feeding Unit: Not Installed ▾  
Finisher: Finisher-C1 ▾  
Mail Box: Enabled ▾  
Side Paper Deck:  Installed  Not Installed

Continue

### Banners

# We looked at a simple set up of CUPS as the Printing System of a single Linux PC

## Advanced Cups features

CUPS can be set up in a **Server \ Client** environment (one or more print servers)

CUPS offers "**Printer Classes**" - the ability to cluster several like printers together

CUPS will accept LPR jobs ( you do lose most of your PPD features) Still supports "printer classes"

# Cluster Like Type Printers with Printer "Classes"

Class on vmchugh-lnx - CUPS v1.1.10 - Konqueror

Location Edit View Go Bookmarks Tools Settings Window Help

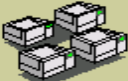
Location <http://127.0.0.1:631/classes>

**ESP** Administration Classes Help Jobs Printers Software

## Class

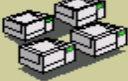
Default Destination: [sales1](#)

**cluster** Printer Class

 Description: High Speed B&W Cluster (2 105s & 1 8500)  
Location: Production  
Class State: idle, accepting jobs.  
Members: ir105,ir105b,ir8500

Print Test Page Stop Class Reject Jobs Modify Class Delete Class

**ColorCluster** Printer Class

 Description: CP650 & irC2050  
Location: Graphics Arts Dept  
Class State: idle, accepting jobs.  
Members: Color650,irC2050

Print Test Page Stop Class Reject Jobs Modify Class Delete Class

Add Class

Copyright 1993-2001 Easy Software Products, All Rights Reserved. The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). All other trademarks are the property of their respective owners.

(xconsole) Konqueror 21:33

# Where to find help - CUPS Documentation "Help"

The screenshot shows a Netscape 6 browser window with the address bar containing `http://127.0.0.1:631/documentation.html`. The page title is "Documentation - Common UNIX Printing System - Netscape 6". The browser's menu bar includes File, Edit, View, Search, Go, Bookmarks, Tasks, and Help. The address bar has navigation buttons and a search field. Below the address bar is a toolbar with icons for Home, My Netscape, Search, Shop, Bookmarks, The Mozilla Or..., and Latest Builds. The main content area has a navigation bar with links: ESP, Administration, Classes, Help, Jobs, Printers, and Software. The page title is "Documentation". The main text reads: "The following documentation for CUPS is available on this server:". Below this is a bulleted list of links to various documents, each with HTML and PDF options. At the bottom, a copyright notice states: "The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of Easy Software Products. CUPS is copyright 1997-2001 by Easy Software Products. All Rights Reserved." The browser's status bar at the bottom shows "Document: Done (0.284 secs)".

Documentation - Common UNIX Printing System - Netscape 6

File Edit View Search Go Bookmarks Tasks Help

http://127.0.0.1:631/documentation.html Search

Home My Netscape Search Shop Bookmarks The Mozilla Or... Latest Builds

My... Tabs

ESP Administration Classes Help Jobs Printers Software

## Documentation

The following documentation for CUPS is available on this server:

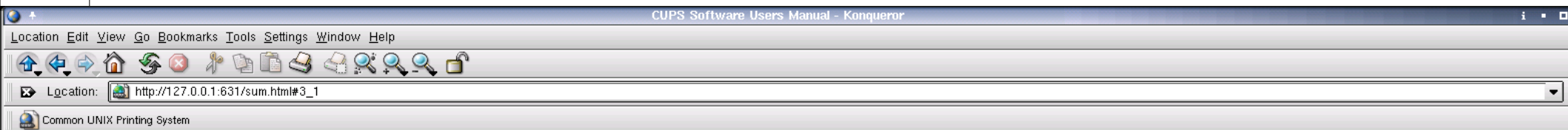
- Whitepaper - An Overview of the Common UNIX Printing System ([HTML](#) | [PDF](#))
- Software Users Manual ([HTML](#) | [PDF](#))
- Software Administrators Manual ([HTML](#) | [PDF](#))
- Software Programmers Manual ([HTML](#) | [PDF](#))
- Configuration Management Plan ([HTML](#) | [PDF](#))
- CUPS Implementation of IPP ([HTML](#) | [PDF](#))
- Interface Design Description ([HTML](#) | [PDF](#))
- Software Design Description ([HTML](#) | [PDF](#))
- Software Performance Specification ([HTML](#) | [PDF](#))
- Software Version Description ([HTML](#) | [PDF](#))
- Software Security Report ([HTML](#) | [PDF](#))

---

The Common UNIX Printing System, CUPS, and the CUPS logo are the trademark property of [Easy Software Products](#). CUPS is copyright 1997-2001 by Easy Software Products. All Rights Reserved.

Document: Done (0.284 secs)

# Here is the Help section for Printing via the Command Line



## Submitting Files for Printing

CUPS provides both the System V (`lp (1)`) and Berkeley (`lpr (1)`) printing commands. Type the following command to print a file to the default (or only) printer on the system:

```
lp filename ENTER
```

or:

```
lpr filename ENTER
```

CUPS understands many different types of files directly, including PostScript and image files. This allows you to print from inside your applications or at the command-line, whichever is most convenient!

## Choosing a Printer

Many systems will have more than one printer available to the user. These printers can be attached to the local system via a parallel, serial, or USB port, or available over the network.

Use the `lpstat (1)` command to see a list of available printers:

```
lpstat -p -d ENTER
```

The `-p` option specifies that you want to see a list of printers, and the `-d` option reports the current system default printer or class.

Use the `-d` option with the `lp` command to print to a specific printer:

```
lp -d printer filename ENTER
```

or the `-P` option with the `lpr` command:

```
lpr -P printer filename ENTER
```

## Setting Printer Options

For many types of files, the default printer options may be sufficient for your needs. However, there may be times when you need to change the options for a particular file you are printing.

The `lp` and `lpr` commands allow you to pass printer options using the `-o` option:

```
lp -o landscape -o scaling=75 -o media=A4 filename.jpg  
lpr -o landscape -o scaling=75 -o media=A4 filename.jpg
```

The available printer options vary depending on the printer. The standard options are described in [Chapter 3, "Standard Printing Options"](#).

## Printing Multiple Copies

Both the `lp` and `lpr` commands have options for printing more than one copy of a file:

```
lp -n num-copies filename ENTER  
lpr -#num-copies filename ENTER
```

Copies are normally *not* collated for you. Use the `-o Collate=True` option to get collated copies :

```
lp -n num-copies -o Collate=True filename ENTER  
lpr -#num-copies -o Collate=True filename ENTER
```

## Checking the Printer Status from the Command-Line

The `lpstat` command can be used to check for jobs that you have submitted for printing:

# PART TWO: IMAGING & SCANNING

Why is **Scanning** and **Imaging** important to **Linux Users**?

Q. Have you ever heard of the "**Paperless Office**" ?

There were **4 trillion** pieces of paper created in this country last year

Increasing at **22% a year**

Currently **90%** of Corporate America's memory is on paper

**93%** of documents created this year will be digitally stored

**We need to Re-define what a "paperless office" means!**

# ReDefining the "Paperless Office"

It obviously **doesn't mean** getting rid of all paper in the office.  
(I have more paper on my desk than ever before)

Today it means **separating information from paper.**

Giving your users the ability to **EASILY** go from

An electronic document to a paper document AND THEN

To just as **EASILY** go back from a paper document to  
an electronic one

# This part of the Presentation will focus on what We (NECS) have done to integrate **Canon** Scanning to Linux Desktops

The reason we can do this is because  
**Canon** chose to use accepted standards like:

**SMB**

**Email**

**FTP**

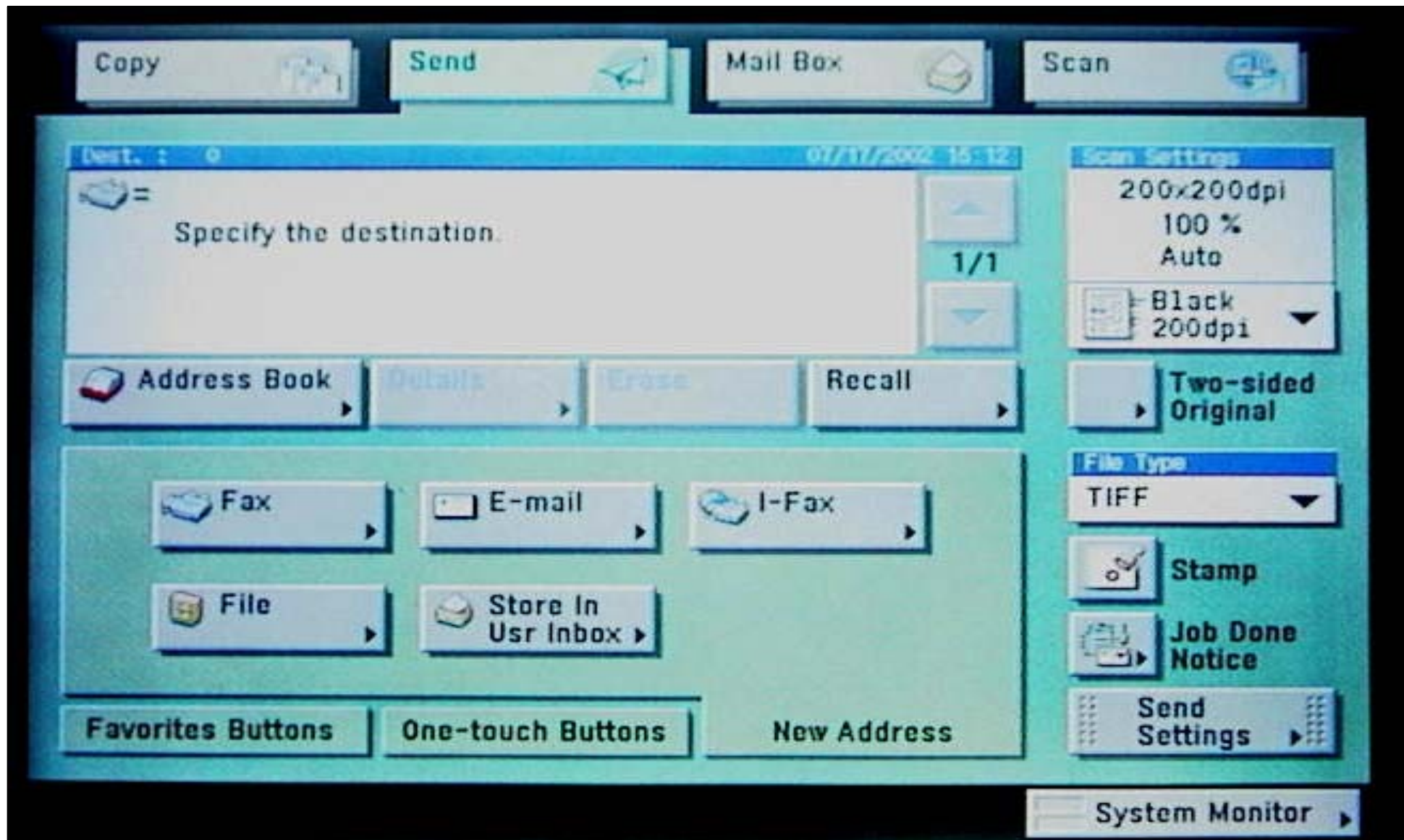
**PDF, Tiff, Mtiff**



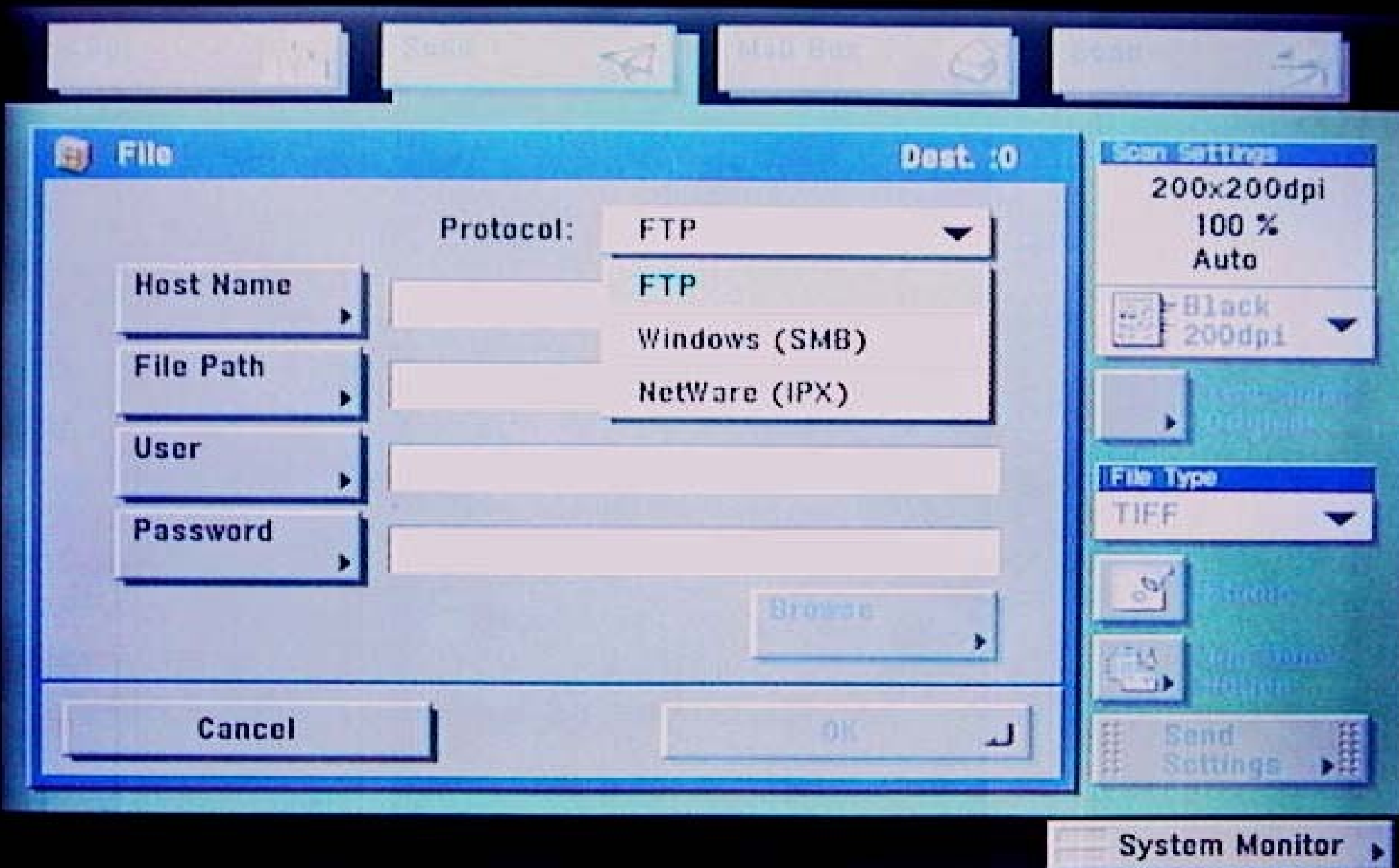
# Canon's "Universal Send"

## Main screen:

### First Let's look at Sending a File



# Send File: Protocol types



# Some Current Limitations

**We can only scan to a Linux/Samba box using "Share" level security. We are able to send to both open and closed shares.**

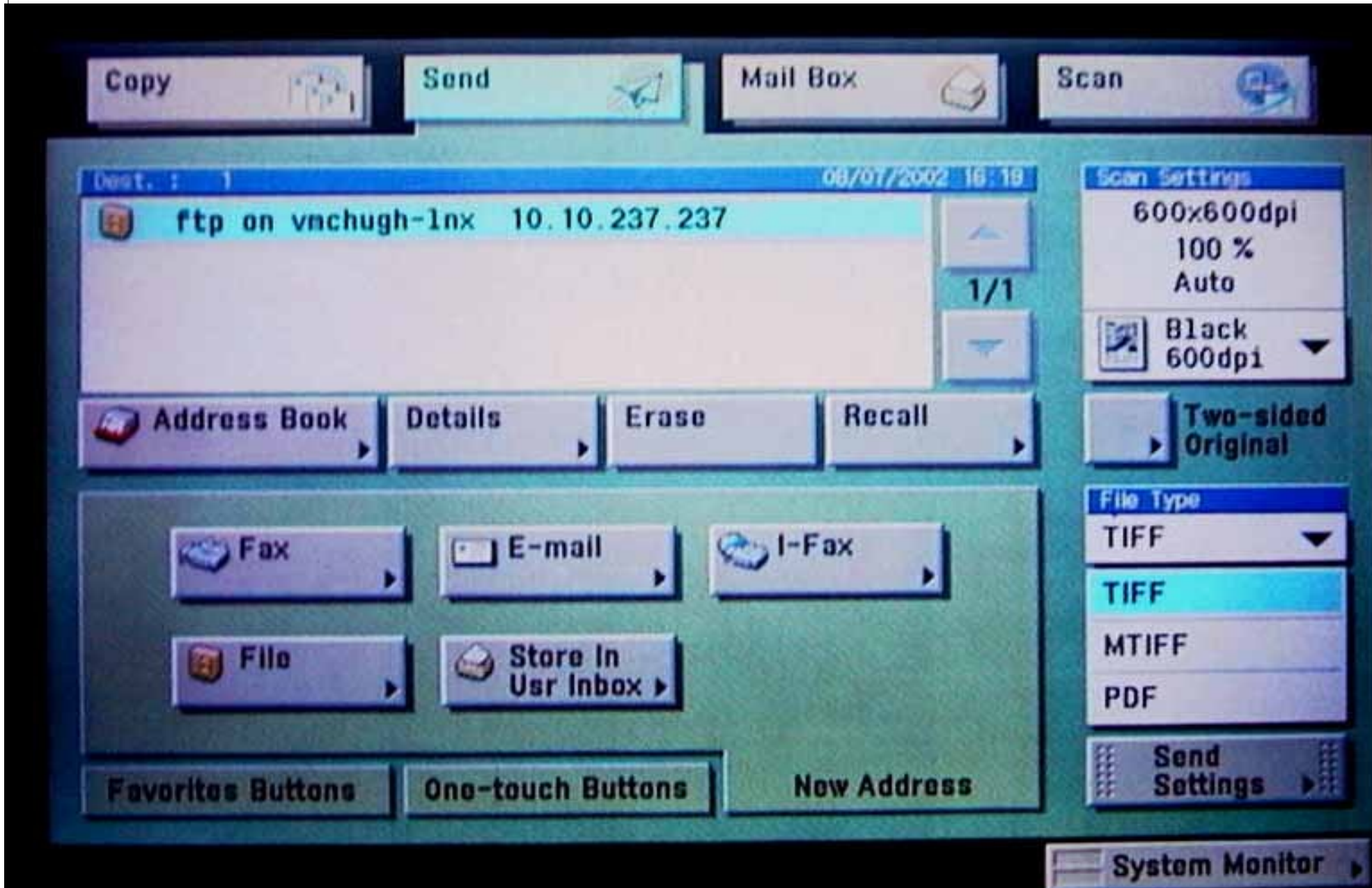
**We can not (at this time) push scan using "User" level security.**

**(We will continue to work on this)**

***This only applies to smb.***

**Email & ftp do work with the Canon "i" series with Push scanning**

# Select Your File type ( Tiff, Mtiff, or PDF )

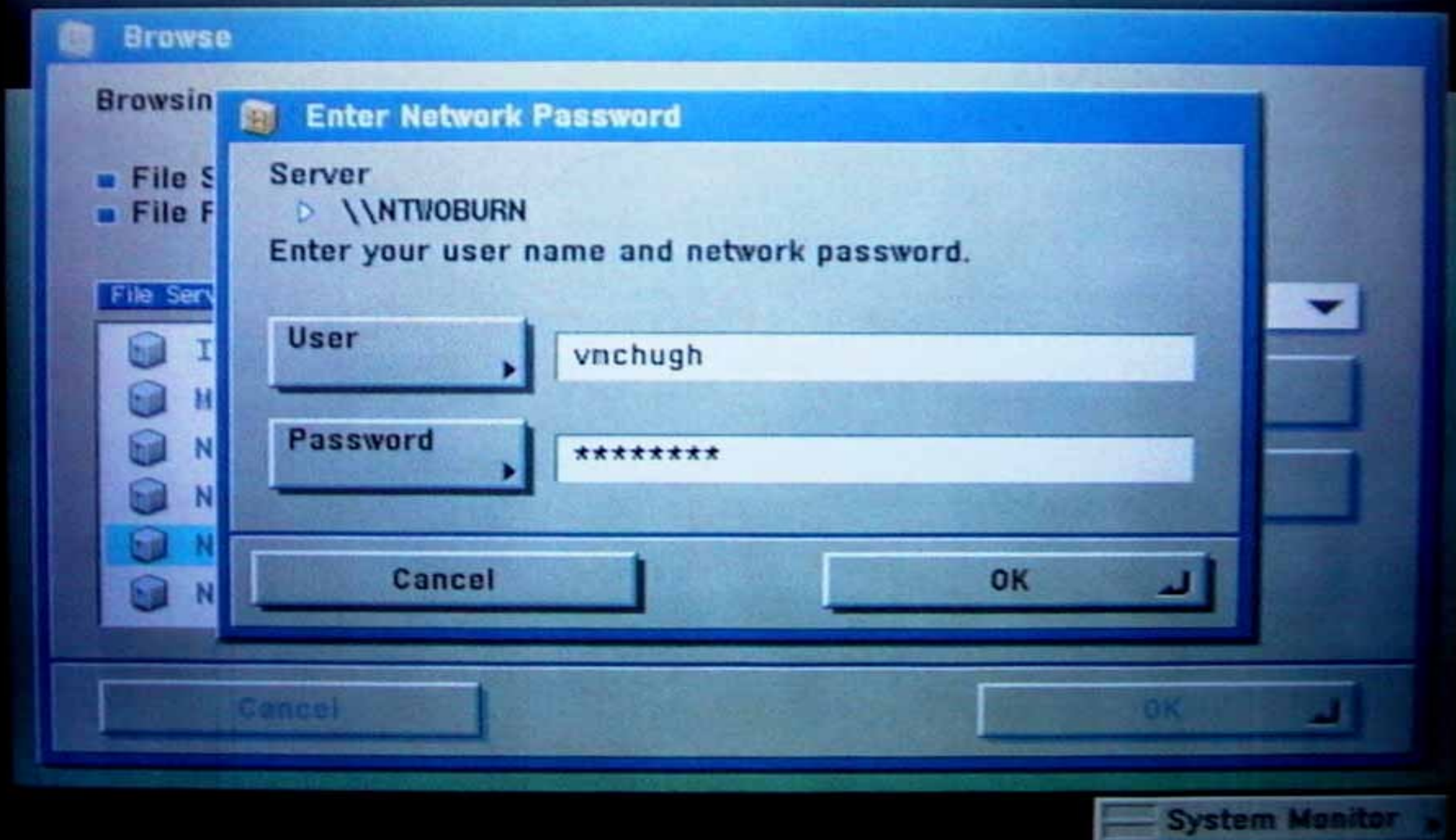


If you choose "smb" you can browse to your samba share  
You can view WorkGroups & Domains



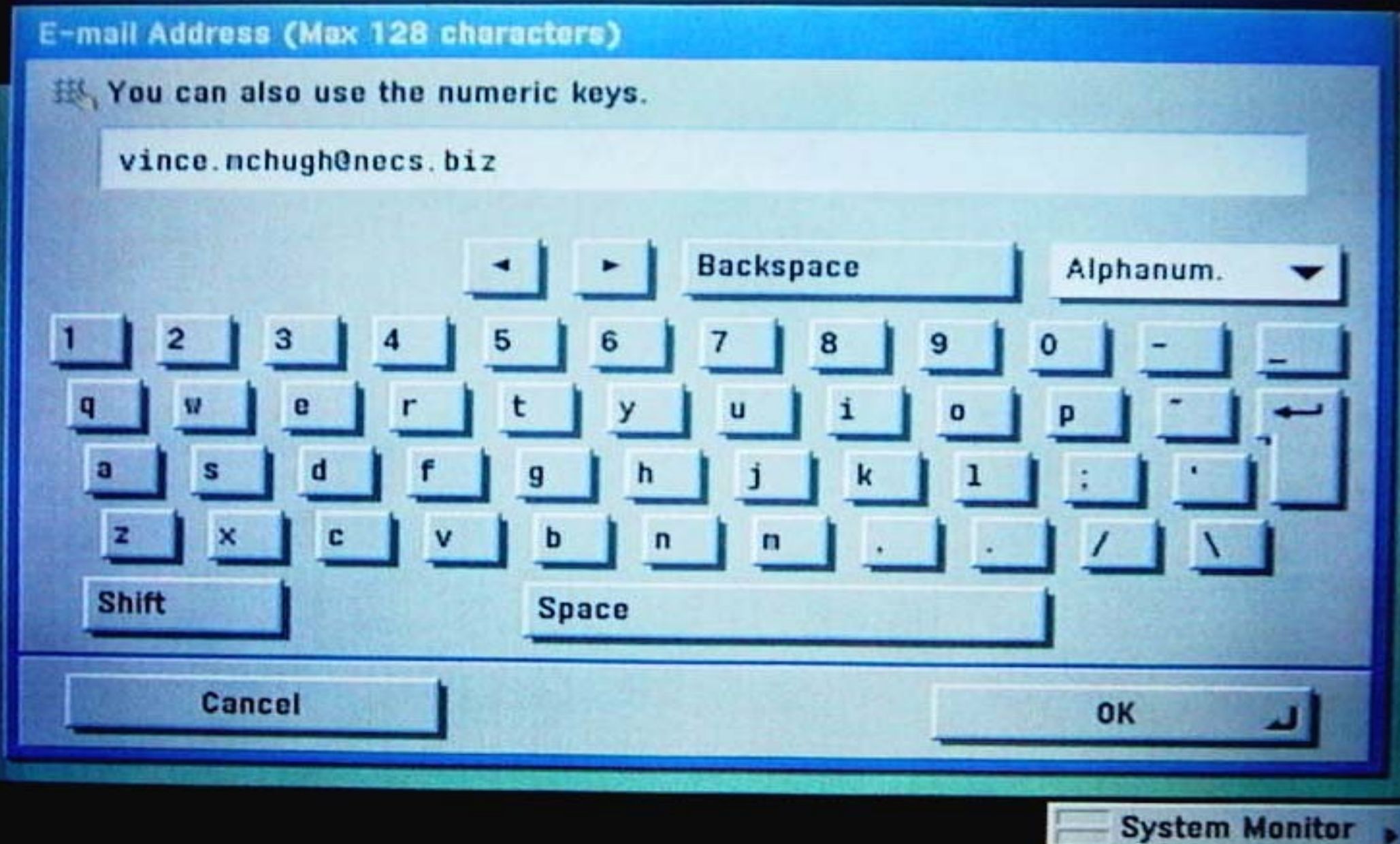
# When browsing security is enforced

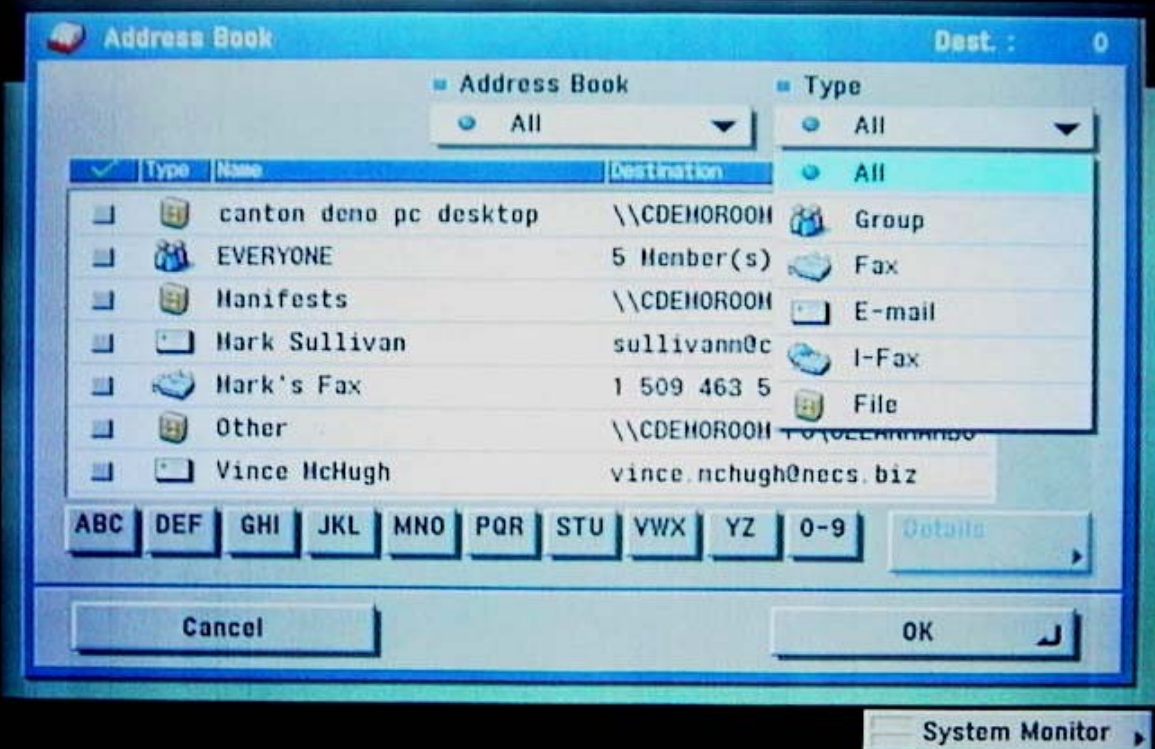
(NTWOBURN is one of our Linux \ Samba servers)



You can type in an **Email address** "on the fly" with the **virtual keyboard** but...

**The 10 built in address books** makes it much easier !!!



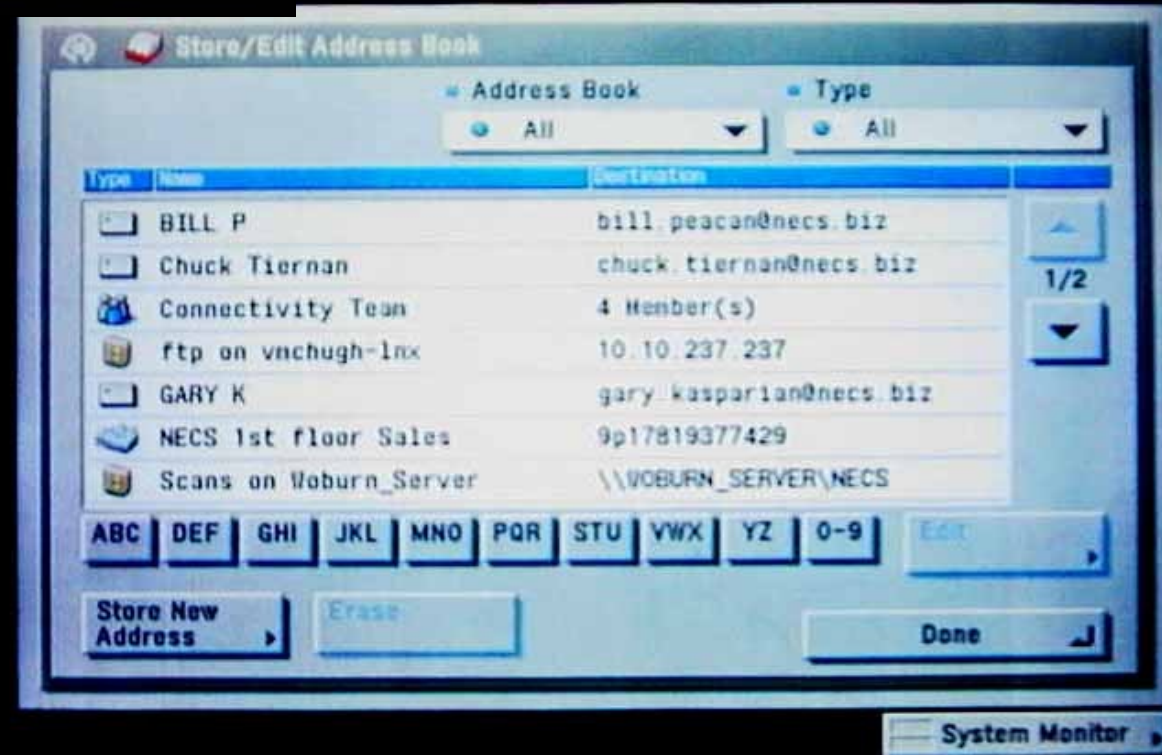


*You can set up 10 different address books*

*You can mix and match any of the address types in any address book.*

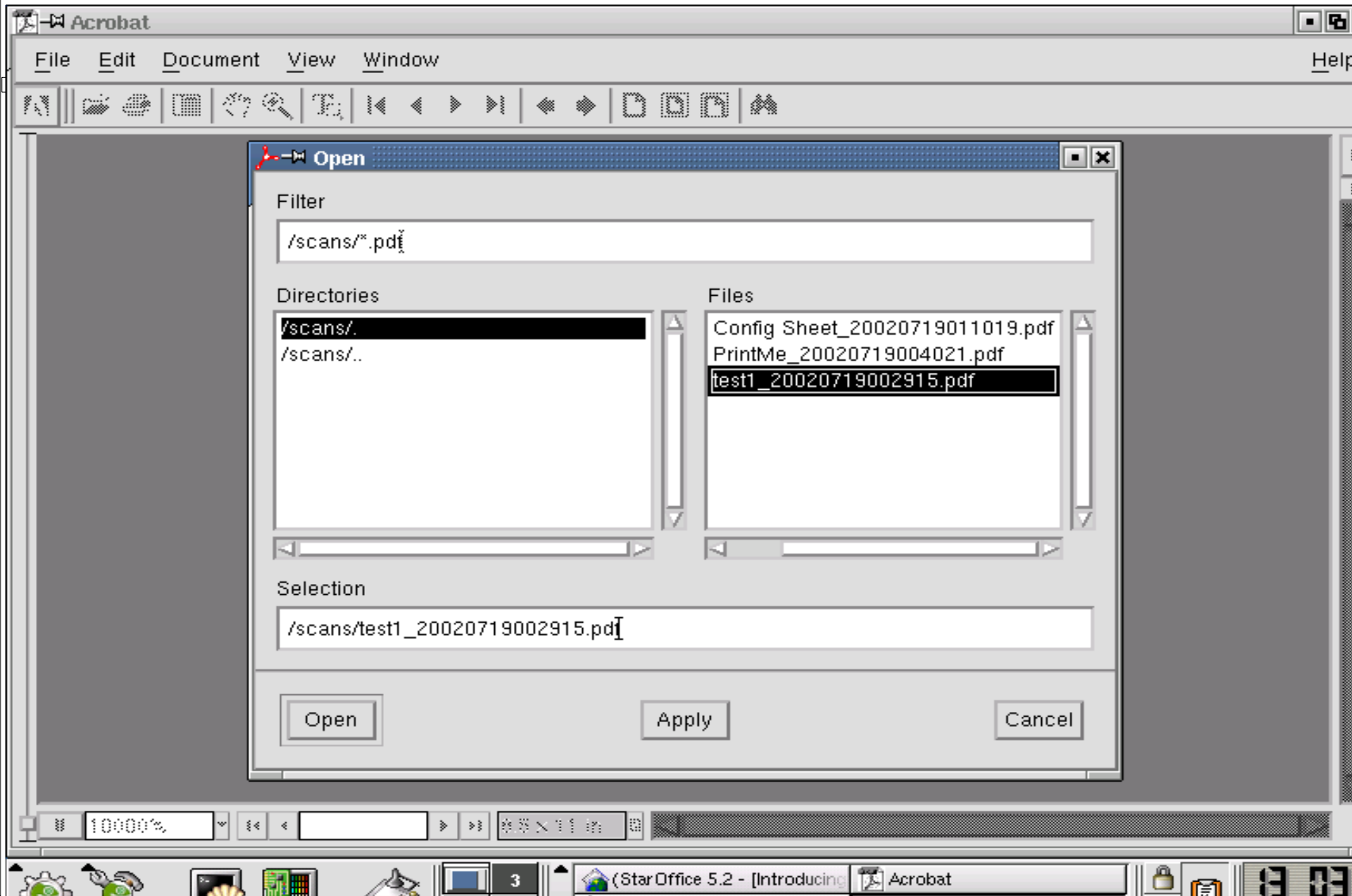
**Email, smb, ftp, fax, i-fax**

**You can even mix address types in a single "Group" send**

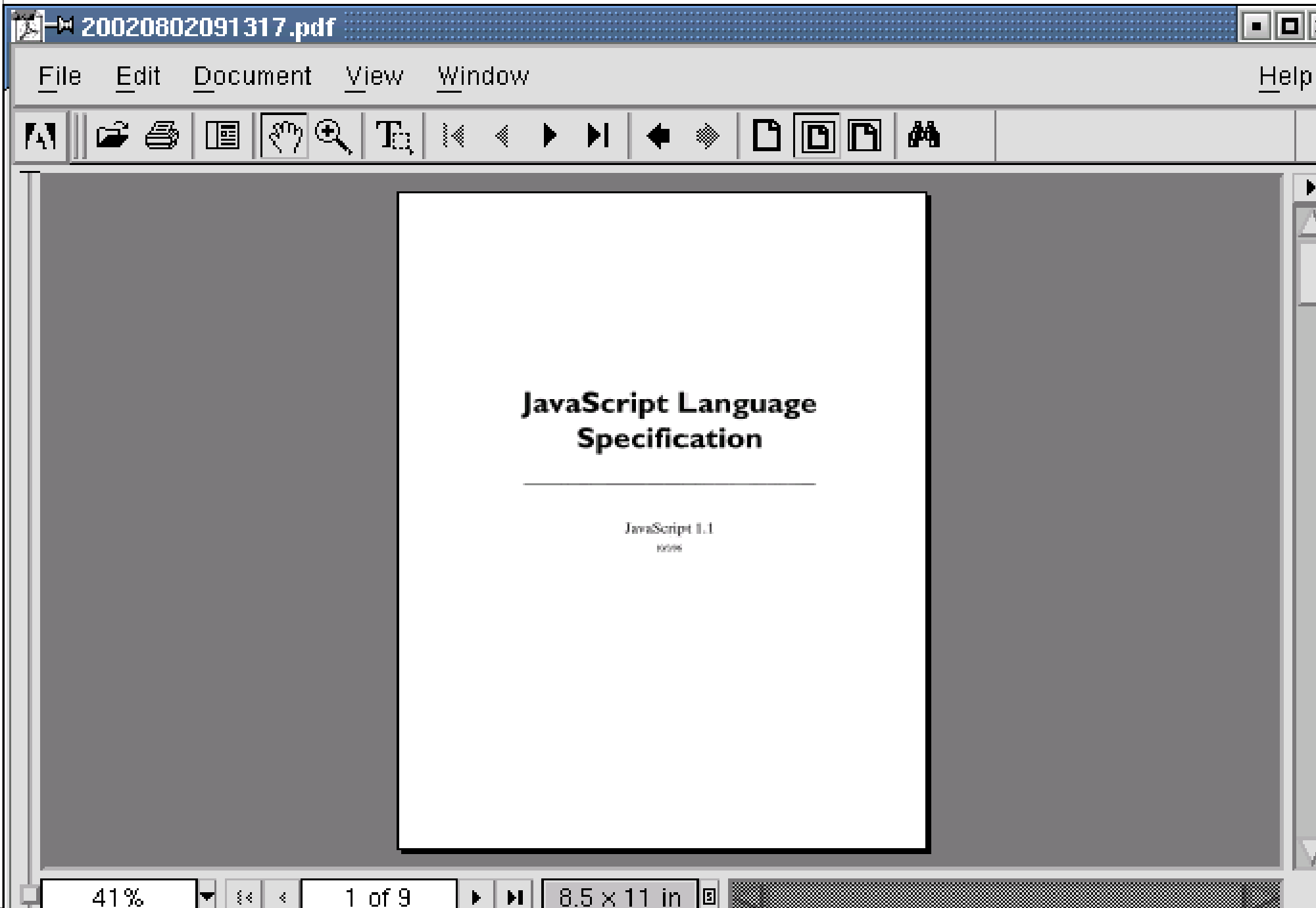


System Monitor

**Once You've sent the file to your Linux Work Station, you can open it with Your favorite PDF or TIFF Viewer.**



# Acrobat Reader on my Linux Work Station



# You can also use Your Linux Email to route your documents

Inbox (47) - Evolution 0.12

File Edit View Actions Tools Help

Send / Receive Compose Reply Reply to All Forward

Shortcuts

- Inbox
- Calendar
- Tasks
- Contacts

Inbox (47) 47 new, 48 total


Search Sender contains

		From	Subject	Sent
		scans@necs.biz	Attached Image	8:53 AM
		scans@necs.biz	Attached Image from NECS\Canon	Yesterday ...
		scans@necs.biz	Attached Image from NECS\Canon	Yesterday ...
		Swanson, Erik <ESwans...	New Build of the MicroPress PSM for...	Yesterday ...
		scans@necs.biz	Attached Image	Fri 10:20 PM
		eCopyFax <eCopyFax-bo...	1 page eCopyFax from 781 937 7930	Fri 1:13 PM
		eCopyFax <eCopyFax-bo...	1 page eCopyFax from 781 937 7930	Fri 12:55 PM
		scans@necs.biz	Attached Image	Fri 8:34 AM
		eCopyFax <eCopyFax-bo...	1 page eCopyFax from 781 937 7930	Thu 2:06 PM
		scans@necs.biz	Attached Image from NECS Canton of...	Thu 1:25 PM

**From:** [scans@necs.biz](mailto:scans@necs.biz)  
**Reply-To:** [vince.mchugh@necs.biz](mailto:vince.mchugh@necs.biz)  
**To:** VINCE MCHUGH <[vince.mchugh@necs.biz](mailto:vince.mchugh@necs.biz)>  
**Subject:** Attached Image  
**Date:** 07 Aug 2002 08:53:07 -0400

PDF document attachment (javascript\_001.pdf)

# *Easy* Email set up

 E-mail/Fax

SMTP Receipt  On  Off  POP  On  Off


SMTP Server ▶ 10.10.25.11

E-mail Address ▶ scans@necs.biz

POP Server ▶ necs.biz

POP Address ▶ 10.10.25.11

POP Password ▶ \*\*\*\*\*

POP Interval (0=Off, 1-99) 10 min 

# Wrap Up

With **CUPS** you get both **lp** and **lpr** with added **modern print features**.

And **Best of All** CUPS makes it **easy to manage**.

**Scanning & Imaging are here to stay!!!**

**Choose companies that use standard ( non proprietary) technologies, protocols, and file formats.**

Then **you** can easily implement **Linux Scanning**.

# Vince McHugh

I am currently The **Systems Support Manager** for the largest independent Canon dealer in New England.

I have been working with **Linux** for about **4 years**.

I am a member of the Greater New Hampshire Linux User Group (**GNHLUG**).

I also read the mailing lists for **blu.org** and **linuxprinting.org** (general and sometimes canon)

I also hold a **Novell CNE** and a Microsoft MCP.

I can be reached through the above mailing lists

or if it's off topic **vince\_mchugh@yahoo.com**