



Tips & Tricks

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Warm Up To Penguins

The Fresh Prints Of Linux



Once upon a time, in a decade not so long ago, configuring a printer under Linux was a perilous task, a quest that required equal parts bravery and foolhardiness to undertake. Only the most stalwart Linux users faced down such a monster and lived to tell the tale.

In any event, setting up a printer in Linux was right up there with getting Sendmail to work, as far as arcane configuration files with mystic codes are concerned. (If you're reading this column, you've probably never had to set up Sendmail; go say "sendmail.cf" to any old-time Unix/Linux geek you know and watch them start gibbering in fear.)

Why was setting up printers such a horror? Well, back in the day, all printing was handled by a system daemon called LPD (line printer daemon), and LPD used a file called `/etc/printcap` to figure out which printers were available and how to talk to them. The `/etc/printcap` file (along with `/etc/termcap`, which served a similar function for terminals) was nearly unreadable. To give you a feel for how bad it was, here's an excerpt:

```
hp8500:\
:rm=hp8500:\
:rp=raw:\
:mx#0:\
:lf=/var/log/hp8500log:\
:sh:\
:sd=/usr/spool/lpd/hp8500:
```

As you can clearly see, this string indicates that a printer called hp8500 is on a remote machine (with an IP address which is mapped by the hostname "hp8500" in `/etc/hosts`) and can receive data in raw form, with no limit to the number of jobs. It specifies a log file and spool directory and suppresses a print header in documents that it prints.

Obviously, this badly fails the "Could my grandmother do it?" test. Happily, CUPS (Common Unix Printing System) now hides all of this from innocent users. Along with CUPS, both GNOME and KDE have graphical tools to help you configure your printer. In a distribution such as Ubuntu, this graphical print manager is preinstalled and ready for use as soon as you install the OS.

■ The Two Printers You Meet In Heaven



There are two categories of printers that CUPS talks to. First, there are the locally installed printers that connect to a USB port (or, more rarely these days, a parallel or serial port). The second category consists of printers that are accessible over the network. You can further break this category down into printers attached to other computers running Windows and printers with their own network adapter. Technically, you could also be connecting to a printer attached to another computer running Linux, but it is similar to the other two cases and not as common unless you're in a corporate or university setting.

Gone are the days of cryptic files necessary to connect to a printer: CUPS makes the process remarkably straightforward.

Let's first look at the case in which you're connecting to a printer with an independent network interface. This used to be restricted to only high-end printers, such as HP LaserJets that cost several thousand dollars. Now, it's common to find laser printers with a network interface that retail for under a hundred dollars. In order to connect to such a printer (in this case, a Brother 5170DN), we started by firing up the CUPS printer manager. In Ubuntu, we clicked System, Administration, and Printing. This opened a window showing all the currently configured printers and has an Add A Printer icon.

We double-clicked this icon to start the printer wizard. The first thing it wants to know is if we are talking about a local or network printer. We selected the Network Printer radio button and had to specify the type of network protocol that the printer uses to communicate. The printer wizard offers four choices. When in doubt, consult your printer's manual to see what protocol it uses. You could connect to another Linux system with a local printer; in this case, you'd select CUPS Printer. You could be connecting to a local printer attached to a Windows computer, in which case you'd want to specify Windows Printer (SMB). Certain HP printers have their own protocol, called Jetdirect.

But in this case (and with most networked printers), our system communicates with the Brother 5170DN using the old LPD protocol we mentioned earlier. Thankfully, CUPS is more than happy to talk to printers using this protocol. Once we selected Unix Printer (LPD), the wizard asked us for the hostname (or IP address) of the printer. If you set up the printer, you'll probably already know what this is; otherwise, most printers have a self-test mode that will print a status sheet with this information. It also asks for a queue name, because another Linux system running LPD might have multiple printers attached. In this case, you'd need to know which printer you wanted. But for a networked laser printer like the Brother, we just left this blank.



CUPS provides an extensive list of Linux printer drivers.

On the next page, we needed to select the type of printer we wanted to connect to. Hopefully, the printer you own will be on this list; it's kept fairly up-to-date. (A simple system update will download any changes.) Unfortunately, if your printer isn't on the list, the chances that its manufacturer will have a Linux driver may be relatively low. You might try using a driver for a similar model, but don't expect this to be successful, either. Obviously, if you're buying a printer expressly to use with your Linux system, checking to make sure that it's on this list is essentially a mandatory step. For the very bold, CUPS' site (www.cups.org) has a driver development kit.

It's also going to ask what driver type to use with the printer. This is because many printers can support more than one type of file. For example, many printers support both PCL (Printer Command Language) and Postscript. In the case of the Brother, the wizard recommends using a Postscript driver. The final screen asked us to supply a name, description, and location for the printer, although only the name is required.

As far as configuring a networked printer is concerned, that's the extent of the difficulty. You'll see a new printer in the Printer Manager, and if you right-click it and select Properties, you'll open a window that will also have a Print Test Page option. If you select that, you can make sure that your printer has been configured correctly. If it does print a test page properly, you know you can use the printer with any application that is compatible with CUPS, which includes the OpenOffice, among others.

■ Do The Printer Samba

If you want to talk to a printer that's connected to a Windows system, select Windows Printer (SMB). SMB (Server Message Block, right) is a Windows networking protocol, implemented under Linux with the Samba package. When you select this, CUPS will start searching your LAN, looking for printers that are available. You'll be asked to provide login credentials to these systems; once you complete that step, you'll receive a list of Windows computers that CUPS discovered. Selecting one of those will give you a list of printers attached to that particular system. Once you've selected that and moved on to the next page, the process is essentially the same as connecting to an LPD networked printer.

■ Think Local

In the final case, a locally connected printer, the first thing you'll be asked to do is select from a list of printers attached to the system that CUPS has detected. Hopefully, if you attached a USB printer, it will already be in the list. If you happen to have an older printer that connects via a serial or parallel port, you may have to tell CUPS which port to use. Again, once you move on to the next page, you'll select the printer type and then give it a name.

Of course, behind the scenes, the printer manager does write out one of those cryptic configuration files. But at least the CUPS configuration file is a bit more readable. For example, after configuring the Brother printer, CUPS placed the following in the `/etc/cups/printers.conf` file:

```
# Printer configuration file for CUPS v1.2.4 # Written by cupsd on 2007-06-25 02:40 <Printer HL-5170DN> Info Brother Duplex
Location Media Room DeviceURI lpd://192.168.1.250/ State Idle StateTime 1182748444 Accepting Yes Shared Yes JobSheets
none none QuotaPeriod 0 PageLimit 0 KLimit 0 OpPolicy default ErrorPolicy retry-job </Printer>
```

It's still not anything your grandmother would have been able to create, but it's quite a bit more readable than the old printcap file. Besides, you should never need to even see this file, because the GUI-based printer managers will keep it all in shape for you. ■

by James Turner

Infinite Loop: The Straw That Saves



Would you drink pond water straight out of the pond? Probably not, but with the LifeStraw, you could; in fact, many people do. Costing a mere \$3, LifeStraw serves as a water filter that's easy to take with you. This could be a revolutionary invention, because more than 1 billion people worldwide live without access to drinkable water, and waterborne diseases such as typhoid kill 6,000 people each day.

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