



Klaus Knopper is the creator of Knoppix and co-founder of the LinuxTag expo. He currently works as a teacher, programmer, and consultant. If you have a configuration problem, or if you just want to learn more about how Linux works, send your questions to: klaus@linux-magazine.com.

# ASK KLAUS!



that are not simulated with tools like memtest86+.

The following test recipe worked well for me in one case where everything else just did not find anything wrong. There should be enough space in `/tmp/` in order to do the test:

1. Start with something like the following:

```
dd if=/dev/urandom >
of=/tmp/test1 bs=1000k >
count=size_of_your_memory_in_MB
```

2. As root (required for `-f` option), do some (a dozen):

```
ping -f localhost >
>/dev/null 2>&1 &
ping -f localhost >
>/dev/null 2>&1 &
ping -f localhost >
>/dev/null 2>&1 &
...
```

Each `ping -f localhost` will add a system load of about 1-2.

3. Then perform the following test to investigate the problem:

```
while true; do
cp /tmp/test1 /tmp/test2;
md5sum /tmp/test1
/tmp/test2; done
```

In the case that the files differ (different md5 sums), there are either randomly changing bits in your computer's RAM memory (use a ramdisk in order to rule out a harddisk error), or some IO controller (harddisk, PCI bridge?) has gone crazy. In this case, I would let the vendor who sold it to you replace the board as a

warranty case, because it is a terrible task to find out which type of RAM with which BIOS timing will work out on your own, and whatever you decide, this will probably not give you the "perfect" setting.

And no, it is *not* "a Linux-related problem" if the test I described clearly shows errors.

## USB Mice



I really want to use a mouse with my Linux portable computer. Unfortunately, the latest laptops don't come with PS2 connections.

The obvious answer would be to use a USB mouse, however, in poking around on several Linux distributions, I found that Xorg doesn't seem to run properly with a USB (USB2.0) mouse. I noticed, however, that if I stick in the Knoppix CD to use my computer with Knoppix, there is no problem whatsoever with a USB mouse. The fact that Knoppix works with a USB mouse makes me think this mouse problem is not something about the hardware.

Unlike many contemporary distros, Knoppix still uses XFree and not Xorg.

What is the problem and how can I fix it? I'm running an HP NX6110; dmesg indicates a memory clash, leaving the mouse with a message that it has run out of available MTRR.

Ideally, I would like to get the laptop working under the latest version of Slackware, which uses the Xorg graphics system. The main application I intend to run uses the PostgreSQL database, and I'm sure I could get it to run under other Linux distributions if necessary.

## System Crash



My system keeps crashing at moments that seem completely random. Someone suggested I do a "memory dump" to look for clues. Are there some tools I can use to analyze the memory contents? If so, what should I look for?



Try running memtest86+ from a boot floppy first, <http://www.memtest.org/>. memtest86+ will do a thorough check of your computer's RAM. Sometimes this check finds bad RAM. Sometimes, however, memory errors are caused by bad refresh timings set in the BIOS. These kinds of problems may only occur under heavy system load

**Listing 1: PS/2 Mouse in xorg.conf**

```
01 Section "InputDevice"
02 Identifier "PS/2 Mouse"
03 Driver      "mouse"
04 Option      "Protocol" "auto"
05 Option      "ZAxisMapping" "4 5"
06 Option      "Device" "/dev/psaux"
07 Option      "Emulate3Buttons" "true"
08 Option      "Emulate3Timeout" "70"
09 Option      "SendCoreEvents" "true"
10 EndSection
```



The question falls into several categories, so I'll split my answer.

**Laptops without PS/2**

I used to think that a laptop without a PS/2 connector was something probably no vendor would be able to sell. Well, it seems that this assumption of mine has just been proven wrong. So there really are computers that don't have a PS/2 connector? I should have guessed, since I remember the days when they started removing the floppy drives yet keeping a disfunctional floppy controller on the board for "compatibility reasons"...

No big deal, though. Linux, even with PS/2 support built in, will run fine without a PS/2 device.

**Hardware Problem?**

It *could* be a hardware problem if the kernel gets stuck when trying to access a non-existing PS/2 mouse or a PS/2 port with really broken interrupt routing (maybe ACPI or APIC is the reason).

If this is the problem in your case, you

could think about maybe adding something like:

```
acpi=off
```

or the opposite

```
acpi=force
```

and/or

```
noapic npbios=off
```

to the *APPEND* kernel options for lilo, grub or *syslinux*. This could save you from disfunctional interrupts. Also:

```
pci=irqmask=0x0e98
```

is reported to be helpful in case of PS/2 related interrupt problems.

**XFree vs. Xorg Servers and PS/2 vs. USB mice**

To the best of my knowledge, the XFree and Xorg servers are not only syntax-compatible from their configuration files in a wide range, but also share the same kind of hardware detection. Also, Knoppix 5 is already using Xorg (with almost the same configuration file that XFree had). Primarily this switch to Xorg is because virtually every distribution (including Debian) is switching to Xorg nowadays.

So, getting the USB mouse and Xorg to work correctly without a PS/2 mouse as a primary pointer device is more of a (mis-)configuration issue than a problem related to the issues of Xorg vs. XFree.

Have a look inside */etc/X11/xorg.conf*. Whether you have several mice attached to your computer, only one mouse, or no mouse at all, make sure that the following entry exists in *xorg.conf*:

```
Section "ServerFlags"
Option "AllowMouseOpenFail" "true"
EndSection
```

This will allow your X Server to start, even when there is an error in the internal mouse setup procedure of XFree/Xorg.

Now, if it so happens that you have a completely uncooperative mouse, with the pointer just sitting in the middle of your screen and not responding to anything, you can still use the keyboard to simulate mouse movements. Press *Left-Control-Shift-NumLock* (on the numeric keypad) simultaneously. Usually, this causes a short beep. Then you should be able to move the mouse using the number keys on the numeric keypad (or the number key emulation using the extended function key on some laptops). In some cases, you need to hit the NumLock key TWICE to let this work. Note that this is an X Server feature, so it should not depend on the type of desktop you use.

Anyway, let's try to get the USB mouse working (with or without the additional PS/2 mouse).

Knoppix (sometimes) has two or more mice listed in the *ServerLayout* section of *xorg.conf* (see Listing 3 on p58).

An XFree/Xorg expert may point out that this approach is completely wrong,

**Listing 2: USB mouse entry in xorg.conf**

```
01 Section "InputDevice"
02 Identifier "USB Mouse"
03 Driver      "mouse"
04 Option      "Device" "/dev/
input/mice"
05 Option      "SendCoreEvents" "true"
06 Option      "Protocol" "IMPS/2"
07 Option      "ZAxisMapping" "4 5"
08 Option      "Buttons" "5"
09 EndSection
```



because there can only be ONE *CorePointer*.

Also, XFree/Xorg generates a big warning about the fact that there are TWO of these pointers present in the config file. Well, in spite of the warning message about extra pointers, this configuration has been working perfectly in Knoppix, exactly in this syntax, for years now, and X needs at least one working *CorePointer* in order for mouse operations to work. This option gives you a backup in case one fails in initialization; so yes, Xorg can have more than one *CorePointer*.

But in the case of a laptop that doesn't have a PS/2 connector, and just happens not to have an "internal" PS/2 touchpad or stick, you can remove or comment out the *InputDevice "PS/2 Mouse" "CorePointer"* line.

Listing 1 (see p57) is an example of a "PS/2 Mouse" entry:

The configuration in Listing 1 can even stay in *xorg.conf* if the *InputDevice "PS/2 Mouse" "CorePointer"* line has been removed from the *ServerLayout* section.

For a USB mouse, see the example in Listing 2 (p57).

The configuration in Listing 2 should work for the majority of USB mice. If */dev/input/mice* seems dead, you probably have no "evdev" compiled in the kernel or the "evdev" module is not loaded. For some kernels, the PS/2 mouse events are replicated in */dev/input/mice*, together with the USB mouse events, so you actually really need ONLY the *InputDevice "USB Mouse" "CorePointer"* line in *ServerLayout* and can safely remove the "PS/2" line.

After you restart Xorg, both the internal and external mouse should be working. If you plug in the external mouse some time later, and the external mouse is not immediately recognized, you should be able to activate the mouse without restarting X

### Listing 3: Mouse entry in Knoppix

```
01 Section "ServerLayout"
02 ...
03 InputDevice      "USB Mouse"
   "CorePointer"
04 InputDevice      "PS/2 Mouse"
   "CorePointer"
05 EndSection
```

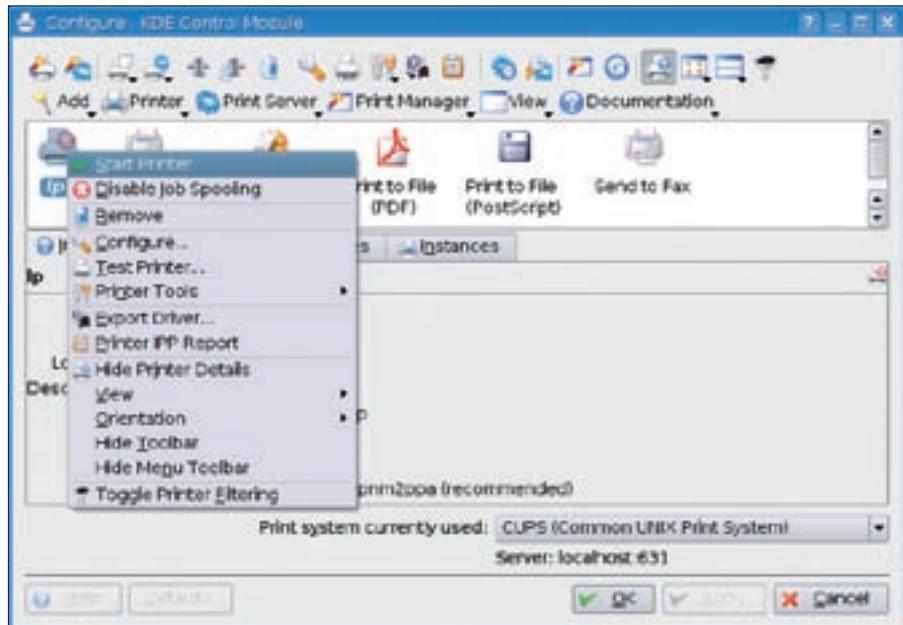


Figure 1: Change the printer settings by clicking the right mouse button in the KDE print-manager „kcmshell printmgr“.

by just switching to the text console and then switching back to X.

### Disconnected Printer

**?** I have a USB printer attached to a Suse Linux 9.3 system. Whenever the USB cable for the printer gets unhooked, the printer configuration stops working – even if I reboot and attach the cable to the same port where it was attached before. I have to delete the old printer configuration and reinstall the printer in Yast. Why is this necessary? Does the problem reflect some eternal characteristic of the USB subsystem? If so, is there some setting I can change in a configuration file that will fix the problem without requiring me to reinstall the printer?

**💡** Frankly, I don't think that cups would change the printer configuration when you just unplug the printer. One explanation related to the case of an USB printer would be that the firmware of the printer must be uploaded to the printer again when you plug it in. If hotplug or udev "forget" this, the printer itself just won't respond to anything until a reboot or restart of the corresponding USB module forces an upload of the firmware. My advice in this case would just be, don't buy a printer that does not work out-of-the-box (i.e., which needs a firmware upload prior to normal operation).

My second guess is that the printer status in cups is just marked as "offline" when you unplug the printer, and cups is configured in a way that does not support automatic rescanning for the "back online" status. What you can do to verify this, is:

1. Open the printer configuration window. In KDE, enter the following

```
kcmshell printmgr
```

2. Right-click on the printer and check if its status says "online." You can also restart/enable this printer with the right mouse button.

The same thing can be done with the less convenient cups web frontend, which you will find at the address <http://localhost:631/printers/>.

I also have a third guess: check if there are still some print jobs left that may contain invalid data (like wrong/corrupted PDF). You will have to delete these print jobs from the queue in order to get the printer back to normal operation.

You should, in any case, check the logs in */var/log/cups* thoroughly for errors, and also see if *dmesg* reveals anything about the printer port. ■

Send your Linux questions to [klaus@linux-magazine.com](mailto:klaus@linux-magazine.com).