

Using a PS/2 mouse in X and gpm simultaneously

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Contents

1	kernel 2.4 and 2.2	3
1.1	Step-by-Step	3
1.2	Example 1 - 2.4 only	5
1.3	Example 2 - 2.6 and 2.4	6
2	kernel 2.6	6
A	Additional Reading	7
B	Significant Changes	7

1 kernel 2.4 and 2.2

Many linux users want their mouse to function in the console as well as in X. Mouse interaction on the console is provided by gpm. The problem is that only one process may actually use the PS/2 mouse device file, `/dev/psaux` with a a 2.4 (or 2.2) kernel. If both X and gpm are configured to read that device, then a race condition exists where each process will get only some of the input. As a result, the mouse will act erratic in both applications because neither has the complete data stream.

There is, however, a way to configure X and gpm to cooperate and have the mouse work correctly in both environments. gpm has the ability to repeat all events it receives out a “named pipe” or “FIFO”. Leverage this capability to allow X to receive events from this virtual device while gpm reads from the actual device. This way there is no conflict or race.

1.1 Step-by-Step

I really can't emphasize strongly enough the process outlined below. If you follow these steps, your mouse will work correctly in the console and in X, at the same time without any aggravation.

1. stop X, get gpm working
 - (a) pick the right device (usually `/dev/psaux`)
 - (b) pick the right protocol (usually `ps2` or `imps2`)
 - (c) `repeat_type=raw`^{††}
 - (d) start gpm, move mouse
 - (e) if this doesn't work, go back to 1.a!
2. get X working
 - (a) pick the right device (`/dev/gpmdata!!`)
 - (b) pick the right protocol (the same one gpm is using; duh :-))^{††}
 - (c) start X, move mouse

(d) if this doesn't work, which step did you not follow correctly? :-)

Note the critical elements – device and protocol. If you don't use the right device and the right protocol, it isn't going to work correctly. Period. Correct those two and it will work.

††—————

Peter Samuelson <peter@p12n.org> corrects me as follows :

One comment. Using `repeat_type=raw` is the **wrong** thing to do. Yes, it works in some cases, but not all cases. The officially recommended solution: tell `gpm` to export `repeat_type=ms3`, and tell `X` to use device type 'IntelliMouse', regardless of your actual mouse type. The bonus is, not only does it always work, but it's simpler: the only variable you have to figure out is the `gpm` name for your mouse protocol; the `XFree86` protocol name never changes, it's always `IntelliMouse`.

I can't explain it any better than the `GPM` maintainer, Zephaniah Hull, already did. See <http://bugs.debian.org/233933> for the context:

I have said it MANY times, and I will say it again.

There is exactly ONE protocol which it is valid to talk to `gpm` over `/dev/gpmdata` with, and that protocol is NOT `PS/2`.

No matter how much people scream and yell about how it works fine, this is a perfect example of why trying to use a bi-directional protocol over a `fifo` DOES NOT WORK.

The protocol you need to use is the one `gpm` calls `ms3`, `X` calls it `IntelliMouse`, which is the serial version of the `IMPS/2` protocol, however it is NOT bi-directional, it has 3 buttons, a wheel, and it is safe to use over the `fifo`.

</rant>

All I can say is: 1) that makes sense, 2) `repeat_type=raw` has always worked for me and 3) I never knew that 'ms3' was supposed to be a wheel mouse (I guess the older 'gpm -t help' output didn't mention it).

I, now, recommend following Peter's advice regarding `repeat_type` although I will not personally test it because I am using kernel 2.6 and no longer have a need to use gpm's repeater.

1.2 Example 1 - 2.4 only

This example is for people who only use a 2.4 kernel.^{††}

```
---- /etc/gpm.conf
# /etc/gpm.conf - configuration file for gpm(1)

# If you edit this file by hand, please be aware it is sourced by
# /etc/init.d/gpm and thus all shell meta characters must be
# protected from evaluation (i.e. by quoting them).
#
# This file is used by /etc/init.d/gpm and can be modified by
# /usr/sbin/gpmconfig.
#

repeat_type=raw # same as reading directly from the hardware

# Logitech MouseMan Wheel
device=/dev/psaux
type=imps2

---- /etc/X11/XFree86-4

Section "InputDevice"
    Identifier "Mouse: IMPS/2, Wheel (gpm)"
    Driver      "mouse"
    Option      "ZAxisMapping" "4 5"
```

```
Option      "Protocol" "IMPS/2"
Option      "Device"  "/dev/gpmdata"
EndSection
```

1.3 Example 2 - 2.6 and 2.4

This example is for people who switch back and forth between a 2.6 and 2.4 kernel. The logic in `gpm.conf` instructs `gpm` to use `/dev/psaux` as a second mouse, but only when the running kernel is version 2.4.^{††}

```
---- /etc/gpm.conf
# /etc/gpm.conf - configuration file for gpm(1)

# Logitech MouseMan Wheel
device=/dev/input/mice
type=imps2

# 2.4 kernels don't send PS/2 data to /dev/input/mice
if [ 'uname -r | cut -b 0-3' = '2.4' ] ; then
    append="-M -m /dev/misc/psaux -t imps2 -r 25"
    repeat_type=raw # same as reading directly from the hardware
fi
```

2 kernel 2.6

Kernel 2.4 handles USB mice better than PS/2 mice because multiple processes can access all available mice simultaneously through the `/dev/input/mice` device file. Kernel 2.6 extends this device node to include the PS/2 mouse as well. This means that if you are using a 2.6 kernel you don't need to use the `gpm-as-repeater` technique outlined above. Simply tell `gpm` to read from `/dev/input/mice` and tell `X` to read from `/dev/input/mice` and it will work correctly.

A Additional Reading

The following URLs refer to similar posts on a mailing list. This document was written and published to combine all of that information in one known location so I won't need to search the list's archives the next time the question arises on the list.

- <http://lists.debian.org/debian-user/2004/debian-user-200403/msg04215.html>
- <http://lists.debian.org/debian-user/2003/debian-user-200312/msg06012.html>
- <http://lists.debian.org/debian-user/2003/debian-user-200312/msg05826.html>
- <http://lists.debian.org/debian-user/2003/debian-user-200312/msg05678.html>
- <http://lists.debian.org/debian-user/2002/debian-user-200201/msg01960.html>
- <http://lists.debian.org/debian-user/2001/debian-user-200112/msg03414.html>

B Significant Changes

2004-03-24 Added correction from Peter Samuelson regarding `gpm`'s `repeat_type` parameter.
(<http://lists.debian.org/debian-user/2004/debian-user-200403/msg04215.html>)

2004-03-01 Initial release.