

Re: Fwd: Removing Giant from a driver

Source: <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/hackers/2006-10/msg00165.html>

- *From:* usleepless@xxxxxxxxxx
 - *Date:* Sat, 21 Oct 2006 00:50:12 +0200
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Dear John-Mark,

> what should it look like?

You should be creating a mutex (using `mtx_init`) at attach time, and pass that mutex instead of Giant...

and don't touch `busdma_lock_mutex`? (i am passing NULL, NULL at the moment)

> and how will i prevent the interrupt routine from interfering with
> userland operations? can i place a "mtx_lock()" call in the interrupt
> routine?

Correct.... Fast interrupt handlers cannot use a sleeping mutex, but I doubt this driver is using a fast interrupt handler...

what is the benefit of a fast interrupt handler? (i assume a taskqueue is involved). the interrupt-dma-code of this driver includes `tsleep`-calls. does that hurt? i have a shared interrupt with the second tuner-module and my soundcard.

i ask because the performance on my FreeBSD 6.x, P4 2.4ghz, 1 card, 2 tuners setup dissapoints me compared to my 4.11, P3 1.0ghz(!), 2 cards, 4 tuners setup.

the 4.11 machine is headless, the 6.x machine has 2 lcds through 1 ati-radeon. it is on the 6.x machine i try to run mythfrontend and use the card at the same time.

i can imagine this is very complex: the 6.x machine is dealing with:
- capturing video (using this driver)
- running mythfrontend (driving XVideo and OSS)
- mythbackend reading from the cxm device, and writing to a NFS-share

this driver is generating about 1 megabyte per second. the 4.11

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machine is handling 4 x 1 megabyte per second just fine writing it to disk, and doing other stuff (apache, postgresql, hylafax, firewall, natd, nfs-server, mythbackends).

> is there a howto somewhere?

There are man pages on how to use the various locking primitives, but it is assumed that you have knowledge of concurrent programming...

i have, i know mutexes, semaphores, critical sections etc. heck, i implemented 32-bits threading for watson-c on w3.11 once.

i have read <http://www.freebsd.org/projects/busdma/>
– this driver uses the busdma framework
– i have registered the interrupt INTR_MPSAFE
– SMPng locked: i have employed a mutex instead of spltty()
– p!=a safety: i don't think this is relevant right now

but i lack the connection with the freebsd-kernel. for example: i don't understand what Giant is good for. i can imagine Giant is important for a network-interface-driver because of the framework. but what does the cxm driver has to do with it? is transforming this driver to use fast-interrupts worthwhile? (like the if-em driver)

You can take a look at books on pthreads and other related materials for info on using locks...

If you figure out the licensing issues w/ the firmware, I'll import the driver into FreeBSD...

i suppose that will never happen:
– hauppauge firmware is needed
– i used GPLed linux/v4l2 headers and sourefiles to make the pvr150s/500s work

thank you for your time,

regards,

usleep

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