

Fw: Re: Massive sound changes / fix (24/32bit pcm support, new sampling rate converter, various fixes)

Source: <http://unix.derkeiler.com/Mailing-Lists/FreeBSD/current/2005-07/0377.html>

From: sebastian ssmoller (*sebastian.ssmoller_at_gmx.net*)

Date: 07/09/05

Date: Sat, 9 Jul 2005 10:26:16 +0200

To: current@freebsd.org, stable@freebsd.org

just FYI ...

regards,
seb

Begin forwarded message:

Date: Sat, 9 Jul 2005 10:24:57 +0200

From: sebastian ssmoller <sebastian.ssmoller@gmx.net>

To: freebsd-multimedia@freebsd.org

Subject: Re: Massive sound changes / fix (24/32bit pcm support, new sampling rate converter, various fixes)

hi,

i just wanna say: THX! really GREAT work! ... this improves sound quality on my boxes much !! ;-)

THX,
regards,
seb

> *After sometimes, I've decided to release this (massive 4k lines) diff*
> *to our sound driver. This need proper review and confirmation, before*
> *it can be committed.*

>

> *Patches for both HEAD / RELENG_5 available at:*

>

> <http://staff.mybsd.org.my/skywizard/FreeBSD/sound/>

>

> *(Note the snd_RELTAG*.diff)*

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>

> *Whats New*

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> =====
>
> 1. Support wide range sampling rate as low as 1hz up to int32 max
> (which is, insane) through new feeder_rate, multiple precisions
> choice (32/64 bit converter). This is indeed, quite insane, but it
> does give us more room and flexibility.
> 2. Support 24/32 bit pcm format conversion through new, much improved
> feeder_fmt.
>
>
> System wide changes
> =====
>
> 1. sys/soundcard.h
> * Add definition for AFMT_(U/S)24_(B/L)E. This is somehow
> contradict with OSS/Voxware definition of 24bit, but anyway...
>
>
> General sound infrastructure changes
> =====
>
> 1. ac97.c
> * Slightly new method to detect mixer capabilities and resolution.
> This mostly to help CT4730, but apparently it does help other
> cards too (especially via8233x). This probably need further test
> and confirmation from other people with ac97 cards other than via
> / es137x.
> * Aggressive dac power wake up call, again, to help CT4730 (and
> probably others).
> 2. mixer.c / sound.c (high priority / grave severity)
> * Fix super grave serious (call it whatever) panic/death during
> driver unload on second attempt after failure on first (device
> busy).
> 3. buffer.c / dsp.c / sound.h
> * Support for 24/32 AFMT
> 4. feeder_rate.c
> * New implementation of sampling rate conversion with 32/64 bit
> precision, 1 - int32max hz (which is, ridiculous, yet very
> addictive). Much improved / smarter buffer management to not
> cause any missing samples at the end of conversion process
> * Tunable sysctls for various aspect:
> hw.snd.feeder_rate_ratemin - minimum allowable sampling rate
> (default to 4000)
> hw.snd.feeder_rate_ratemax - maximum allowable sampling rate
> (default to 1102500)
> hw.snd.feeder_rate_buffersize - conversion buffer size
> (default to 8192)
> hw.snd.feeder_rate_scaling - scaling / conversion method
> (please refer to the source for explanation). Default to
> previous implementation type.
> 5. feeder_fmt.c / sound.h

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- > * *New implementation, support for 24/32bit conversion, optimized, and simplified. Few routines has been removed (8 to xlaw, 16 to 8). It just doesn't make sense.*
- > 6. *channel.c*
- > * *Support for 24/32 AFMT*
- > * *Fix wrong xruns increment, causing incorrect underruns statistic while using vchans.*
- > 7. *vchan.c (high priority)*
- > * *Support for 24/32 AFMT*
- > * *Proper speed / rate detection especially for fixed rate ac97.*
- > *User can override it using kernel hint:*
- > *hint.pcm.<unit>.vchanrate="xxxx".*
- >
- >
- > *Hardware spessific changes*
- > =====
- >
- > 1. *als4000.c*
- > * *als4000 can't do 48k properly (perhaps it really can't at all!).*
- > *Set maxspeed to 44.1k instead.*
- > * *Add locking / MPSAFE*
- > * *Fix recording*
- > 2. *cmi.c*
- > * *remove busdma_lock_mutex and Giant from bus_dma_tag_create.*
- > *Nothing changes.*
- > 3. *es137x.c / es137x.h*
- > * *Register programming error during device initialization especially for CT4730 / EV1938 chip, causing misconfigured mixer (David Xu), crippled after power cycle (Kevin Oberman). Fixed.*
- > * *Incorporate locking/spdif patches from Jon Noack. Not all es137x can really do spdif, clean it up a bit to only let few capable chip.*
- > * *Convert all bus_space_(read/write) to use es_rd/es_wr, simmlar with other drivers.*
- > * *Add tunable hw.snd.pcm<unit>.latency_timer sysctl to toggle pci latency timer value on the fly. Much noise / pop / crackling issues can be solved by increasing its value. Other people can point out to use pciconf instead, but this is just and added value specifically for braindead CT4730/EV1938.*
- > 4. *via8233.c*
- > * *Add locking / MPSAFE*
- > * *Add kernel hint option to disable DXS channels entirely. Report from several skype users / Pav Lucistnik indicate that disabling DXS fix lots of pop / crackling noise. To disable DXS, add hint.pcm.<unit>.via_dxs_disabled="1" into /boot/device.hints.*
- > *NOTE: It is advisable to disable DXS entirely. Although DXS can provide multiple concurrent access, doing so will cause more harm than good (pop / crackling noise, sudden slowness, overruns). There are few cases where this is considered invalid, but I had to investigate more as this is not a global issue. Use / enable vchans for multiple sound sources*

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> *(Please refer to vchans notes below).*
> 5. *via82c686.c*
> * *Add locking / MPSAFE. I don't have this card, so other people had*
> *to confirm it. Anyway, the logic is correct.*

>

>

> *Notes / Issues*

> =====

>

> * *Virtual Channels (vchans)*

> *Enabling vchans can really, really help to solve overruns*
> *issue. This is quite understandable, because it operate*
> *entirely within its own buffering system without relying on*
> *hardware interrupt / state. Even if you don't need vchan,*
> *just enable single channel can help much.*

> * *Feeder alignment is really a monster on its own, this should*
> *be fixed or revamp in near future.*

> * *Mixer infrastructure is really outdated, without support for*
> *proper multichannel. Best candidate for hacking fest.*

> * *The arrival of 24/32 also come with a price. Applications*
> *that can do 24/32bit playback need to be recompiled (notably*
> *mplayer). Use (recompiled) mplayer to experiment / test /*
> *debug this various format using -af format=fmt. Note that*
> *24bit seeking in mplayer is a little bit broken, sometimes*
> *can cause silence or loud static noise. Pausing / seeking*
> *few times can solve this problem.*

> *You don't have to rebuild world entirely for this. Simply*

> *copy /usr/src/sys/soundcard.h to*

> */usr/include/sys/soundcard.h would suffice. Few drivers also*

> *need recompilation, and this can be done via*

> */usr/src/sys/modules/sound/.*

> *Support for 24bit hardware playback is beyond the scope of*
> *this changes. That would require specific hardware driver*
> *changes and currently I don't have any of it.*

> * *Don't expect playing 999999999hz is a wise decision. Be*
> *reasonable. The new feeder_rate implementation provide*

> *flexibility, not insanity. You can easily chewed up your CPU*
> *with this kind of mind instability. Please use proper*

> *mosquito repellent device for this obvious cracked brain*

> *attempt. As for testing purposes, you can use (again)*

> *mplayer to generate / play with different sampling rate. Use*

> *something like mplayer -af resample=192000:0:0 files..*

>

>

> --

>

> *Ariff Abdullah*

> *MyBSD*

>

> *<http://www.MyBSD.org.my> (IPv6/IPv4)*

> *<http://staff.MyBSD.org.my> (IPv6/IPv4)*

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> <http://tomoyo.MyBSD.org.my> (IPv6/IPv4)

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"Perfection is achieved, not when there is nothing left to add,
but when there is nothing left to take away."

--- Antoine de St. Exupery, Wind, Sand, and Stars, 1939

freebsd-current@freebsd.org mailing list

<http://lists.freebsd.org/mailman/listinfo/freebsd-current>

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