

Nouveau : what's new ?

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Introduction

- Nouveau was started in june 2005
- And announced last year at fosdem 2006
- Purpose : support advanced features (in particular 3D) in an open source nvidia driver
- Nvidia hardware is powerful but complex
 - ... and undocumented
- Targets NV04 up to NV50
 - TNT up to Geforce 8800
 - 10 years range

Introduction

- Driver with no legacy
 - Ability to try new things
 - Requires a kernel module, even for 2D
 - Plan to move modesetting to the kernel
 - Do not freeze the interfaces until they are stable

Last year/This year

- One developer/Half a dozen core developers
- Unknown project/Lots of interest
- No specs/Reverse engineered specs
- Modified nv driver/driver that runs basic (untextured) 3D apps

=> what happened ?

Community building

- Lots of people, lots of contributions
- Bi-weekly development update (irregular nouveau development companion)
 - Keep users updated
 - Show people how drivers work
 - More importantly, prove that we are not slacking !

Reverse engineering

- Renouveau
 - Introduced last year at fosdem
 - Fully user space, non-root
 - Tracks fifo changes
 - Able to track all user-space submitted hardware commands
- kmmio-trace
 - Kernel-based tracer
 - Very new
 - Traps iomaps
 - Generates page fault
 - Catches what renouveau can't catch

Reverse engineering

- Renouveau helped us figure out most 3D functionality
 - Very simple tool
 - Lots of people helped
 - Most 3D functionality is known from nv04 up to nv40 (nv50 pending)
 - But that's not enough...

Past developments

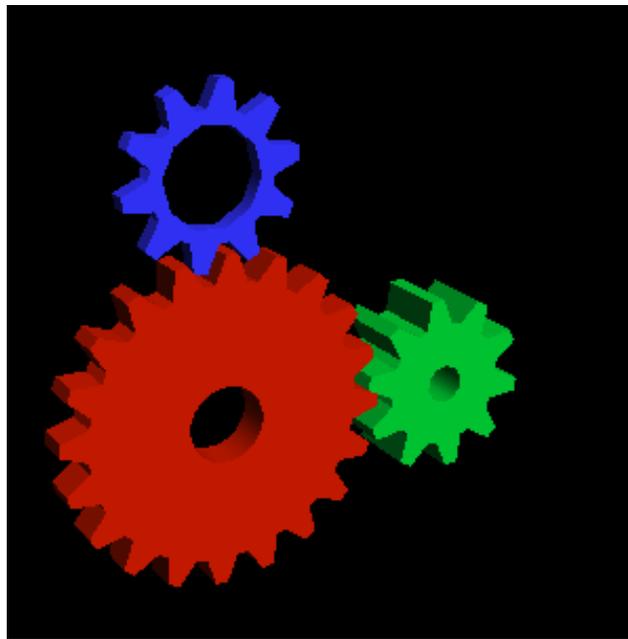
- Kernel driver
 - Hardest part
 - Context switching required heavy reverse engineering
 - Required kernel tracing (kmmio trace)
 - Lots of card-specific bits

Past developments

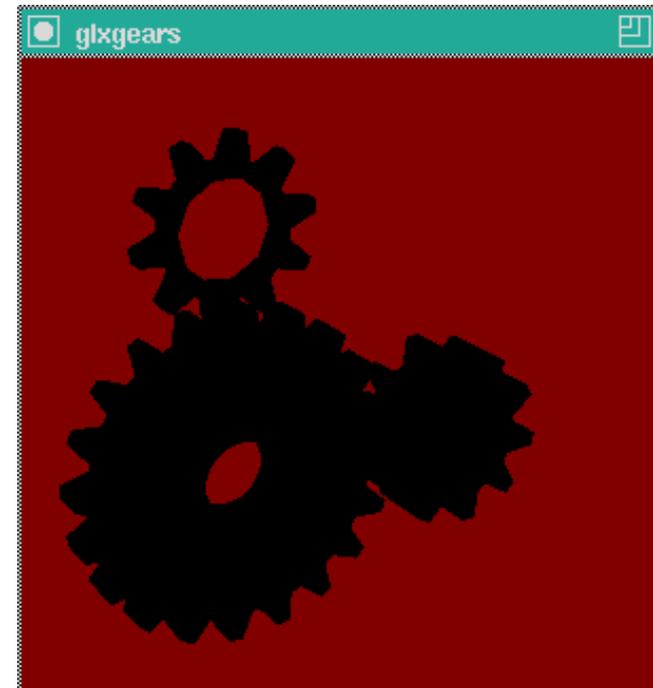
- 2D driver
 - Based on the “nv” driver
 - Moved init code to the kernel
 - Deobfuscated
 - EXA support
 - Support for 3D

Past developments

- 3D driver
 - Wrote a 3D driver from scratch
 - Basic 3D support for nv40
 - Untextured polygons
 - glxgears and other simple applications run



x86 gears



PPC gears

Current developments

- Randr 1.2
 - Partially working on nv28
 - Only analog outputs ATM

Current developments

- NV04 support
 - Not just for fun
 - See how far we can stretch it
- NV10 -> NV30 support
 - DRI mostly ok
 - Now requires kernel support

Future developments

- Texturing support
 - Will require TTM support
 - In turn, requires multiple context support in the TTM
 - Complex
 - Hard to do

Future developments

- Debug PPC issues
- Get 3D to work on NV04/NV10/NV20/NV30
 - Requires in-kernel context switching support
- Get randr 1.2 to work
 - Then move modeesetting to the kernel
- Add solid Xv support
 - DMA for Xv
 - XvMC, who knows ?
- Keep the driver unified !

Conclusion

- Lots of support from people
- New reverse engineering tools
 - In particular, in-kernel
 - Good tools help the development
 - Basic 3D works
 - Now, add texturing support
 - Yes, quake3 is the next milestone
 - But that will require porting to the TTM
 - The tools apply to other driver as well !
 - Interest from the Radeon guys
 - What do we RE next ?

Conclusion

- *«It's so hard to write a graphics driver that open-sourcing it would not help [...] In addition, customers aren't asking for open-source drivers.»*

Andrew Fear, Nvidia software product manager.

http://news.com.com/New+Linux+look+fuels+old+debate/2100-7344_3-6061491.html

Questions ?

<http://nouveau.freedesktop.org>

#nouveau on freenode