

# Nouveau : what's new ?

Stéphane Marchesin <[marchesin@icps.u-strasbg.fr](mailto:marchesin@icps.u-strasbg.fr)>

# 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

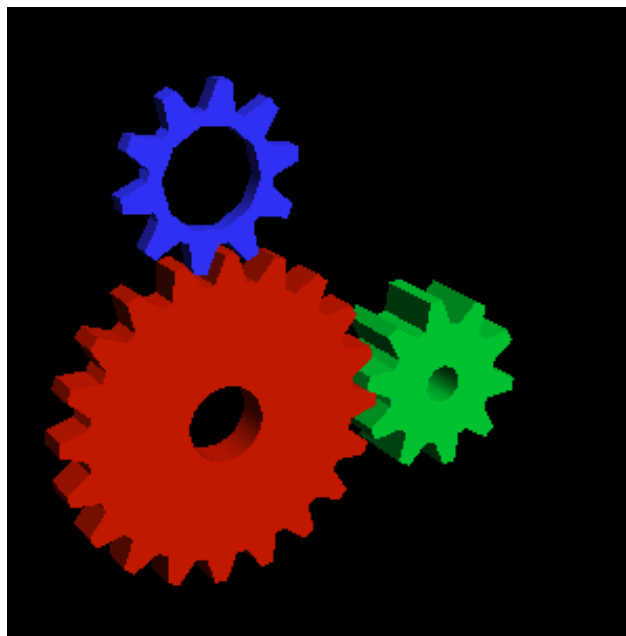


# Past developments

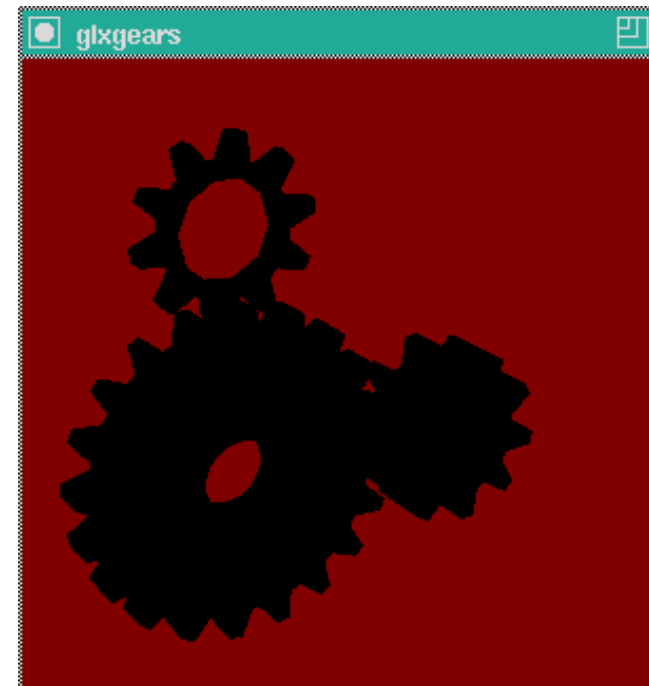
- 2D driver
  - Based on the “nv” driver
  - Moved init code to the kernel
  - Deobfuscated
  - EXA support
  - Support for 3D

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



# Questions ?

<http://nouveau.freedesktop.org>

#nouveau on freenode