State of the Intel Kernel Graphics Driver

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overview

- review of the past year: features, driver internals, testing & documentation
- highlights of upcoming platforms: broadwell, baytrail & cherryview
- future work
feature work, GEM

- real per-process isolation, still disabled
- improved gpu turbo boost/deboost
feature work, display

- 4k displays, unfortunately not yet DP MST
- 3D in the kernel, stack enabling ongoing
- displayless support for servers
driver internals

- massive refactoring: irq, GTT, display ...
- i915.ko is a toolbox to build a Intel GFX driver
driver internals

- lots more shared driver helper libraries
- hdmi infoframes, DP aux (for MST support), ...
testing with intel-gpu-tools

- automated tests are a merge requirement
- over 700 testcases, zarro tests 2 years ago
- supplements full-stack testing
i-g-t infrastructure

- ioctl wrappers, libraries for testing techniques, ...
- NIH testing framework
- piglit as testrunner
testing techniques

- error path testing with signals
- prefault disabling, force slowpaths in debugfs
- gpu hangman
- pipe CRC based display tests
in-kernel infrastructure

- enormous amounts of asserts in display code
- modeset/pipe configuration tracking/checking
- fifo underrun reporting
testing resources

- i-g-t overview: [http://blog.ffwll.ch/2013/09/more-drmi915-testsuite-infrastructure.html](http://blog.ffwll.ch/2013/09/more-drmi915-testsuite-infrastructure.html)
- testing requirements: [http://blog.ffwll.ch/2013/11/testing-requirements-for-drmi915.html](http://blog.ffwll.ch/2013/11/testing-requirements-for-drmi915.html)
documentation

- DRM Developer's Guide
  http://people.freedesktop.org/~danvet/drm/
- intel-gpu-tools test API reference
  http://people.freedesktop.org/~danvet/igt/
broadwell

- gen8 render core: execlists, 48bit ppgtt
- completely new irq routing
- display close match to haswell
baytrail

- frankenstein display with gen7 render core
- display goes back to ... gma500, i915, i8xx
- plus hdmi, DP, MIPI-DSI
cherryview

- gen8 render core
- baytrail display
- 3rd display pipe
outlook: features

- runtime PM for Si0x
- atomic modeset/pageflips
- fastboot for everyone
outlook: non-features

- can't talk about new platforms
- driver documentation
- new crazy test techniques
- integrate and exploit gen8 features
summary

- lots of work under the hood
- testing, testing, testing
- 3 pre-production platforms in upstream
- more of the same, but a lot more
## statistics: patches

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## Regression Fix Latency [days]

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