
Subject: OpenGL + Linux crashes

Posted by [JD Smith](#) on Wed, 03 Mar 2004 02:06:07 GMT

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If you're a user of a recent Linux (like Fedora), and you've experienced crashes of the type:

Floating exception

~

when attempting to use any of IDL's OpenGL 3D stuff (like the Demo -> Itools, for example), you might try the following:

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setenv MESA_NO_ASM 1
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which disables some specific ASM code in the Mesa library which was causing these types of crashes for me. I use an ATI Radeon 7500 + XFree86 4.3.0's radeon drivers. With this fix in place, it seems stable, and is definitely much faster than software rendering. Give a try.

JD

Subject: Re: OpenGL + Linux crashes

Posted by [Michael Wallace](#) on Tue, 09 Mar 2004 18:33:42 GMT

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This is awesome! I also have a Fedora box with an ATI Radeon 7500 and it works great. I'm just curious what assembly language optimizations are conflicting with IDL's OpenGL stuff. Oh, well. At least it works better than using software rendering everywhere.

-Mike

Subject: Re: OpenGL + Linux crashes

Posted by [Karl Schultz](#) on Tue, 09 Mar 2004 20:27:32 GMT

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"Michael Wallace" <mwallace.removethismunge@swri.edu.invalid> wrote in message news:104s3g1s2kg8vf1@corp.supernews.com...

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When a client (like IDL) connects to an X server with the hardware acceleration support, it is really slow to send the GL commands through the X server via X/GLX protocol. So, there is a module called DRI (Direct Rendering Infrastructure) that is used to connect the client application "directly" to the hardware, or more accurately, to the Mesa interface layer that implements OpenGL for the device.

When this Mesa module starts up, it attempts to see if the SSE (Streaming SIMD (Single Instruction Multiple Data) Extensions) instructions are available on the CPU. Unfortunately, one of the steps that must be taken in order to do this reliably on Linux is to force an exception and poke around in the CPU status registers to see if it did what it was supposed to if the SSE instructions are present. The code that does this installs its own exception handler and then removes it when finished. Apparently there is something wrong with this particular code sequence that causes an exception to occur anyway. After reading the code, my *guess* is that the exception handler code isn't clearing the exception state out of the CPU and then IDL

is tripping over it later. It turns out that another application (SDL) has the same problem. I'll be installing Fedora Core 1 soon to investigate further and try to get it fixed in Mesa.

Because it is so tricky to detect and use SSE, the Mesa developers wisely made it possible to avoid it all by setting the env var mentioned above.

Anyway, the SSE instructions are used to speed up common math operations in Mesa, like coordinate transforms and matrix multiplies. These would be more important if Mesa was doing most of the rendering work in software. If you have a good graphics card that does transforms and lighting in hardware, much of this math would occur on the graphics card and so turning off SSE won't hurt performance as much.

If I learn anything more, I'll post it.

Karl

Subject: Re: OpenGL + Linux crashes
Posted by [Foldy Lajos](#) on Tue, 09 Mar 2004 21:07:57 GMT
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On Tue, 9 Mar 2004, Karl Schultz wrote:

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a stupid (?) question: Mesa knows that it is running on linux. Why not does it read /proc/cpuinfo first to learn about CPU features? And go the tricky way if /proc/cpuinfo does not exist.

regards,
lajos

Subject: Re: OpenGL + Linux crashes
Posted by [JD Smith](#) on Thu, 11 Mar 2004 01:22:05 GMT
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On Tue, 09 Mar 2004 13:27:32 -0700, Karl Schultz wrote:

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> "Michael Wallace" <mwallace.removethismunge@swri.edu.invalid> wrote in

> message news:104s3g1s2kg8vf1@corp.supernews.com...
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Thanks Karl:

It's great to know someone at RSI is staying on top of these issues.
Not only do we get an IDL which works with standard drivers, but the
3D support in XFree86 gets improved too! Keep up the good work.

JD

Subject: Re: OpenGL + Linux crashes
Posted by [Karl Schultz](#) on Mon, 15 Mar 2004 15:28:59 GMT
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news:Pine.LNX.4.58.0403092159240.29572@bifur.rmki.kfki.hu...
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This is a very interesting suggestion. Unfortunately, the situation is not that simple.

Intel explains why in
<http://www.intel.com/cd/ids/developer/asmo-na/eng/microprocessors/ia32/pentium4/resources/appnotes/sse/19065.htm>

If you prefer to look at source code, see the files in Mesa (Sourceforge) or XFree86 4.3 (mesa/src/x86).

Subject: Re: OpenGL + Linux crashes
Posted by [Karl Schultz](#) on Mon, 15 Mar 2004 15:50:17 GMT
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"JD Smith" <jdsmith@as.arizona.edu> wrote in message
news:pan.2004.03.11.01.22.05.612878@as.arizona.edu...
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> On Tue, 09 Mar 2004 13:27:32 -0700, Karl Schultz wrote:
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Karl

Subject: Re: OpenGL + Linux crashes

Posted by [JD Smith](#) on Mon, 15 Mar 2004 20:50:14 GMT

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On Mon, 15 Mar 2004 08:50:17 -0700, Karl Schultz wrote:

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> "JD Smith" <jdsmith@as.arizona.edu> wrote in message
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Thanks again Karl. ATI's linux drivers are well regarded, though widely decried for being very late compared to their Windows counterparts, and closed source. The 7xxx era of Radeons also isn't supported, so we're stuck with the DRI project's drivers (fine, but slow, and clearly still containing a few glitches). Do you also test under Linux with the proprietary NVidia drivers?

JD

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Yes. I'll probably end up filing a bug report on XFree86 DRI for the FPE problem. I have gdb'd myself to death in the machine code in the area of interest and I didn't see anything wrong. There must be something going on in a place that I can't see. Some of the code came from Mesa, which I do have the source for, but the rest is proprietary ATI stuff. Without the source code, I can't do much more. The DRI guys have NDA's with ATI for the

Radeon code, so maybe they can see the problem.

In the meantime, a tip of the hat to the Mesa guys for providing the env var to skip around the problem.

- > Do you also test
- > under Linux with the proprietary NVidia drivers?

When I made the changes to IDL for 6.0 to let it work better with the DRI architecture, I tested on a rh9 system with the NVidia drivers.

Karl
