Subject: Re: Multithreading
Posted by Ralf Flicker on Thu, 14 Mar 2002 20:00:14 GMT
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trouble wrote:
>
> Yo,
>
> Just curious, have many people got good performance gains from
> multithreading in 5.5? I'm on a single processor (drat!).
>
> Anyone like to share their findings - how much improvement, how many
> processors, what kind of programs? What platforms?

I second that curiosity. I'm still running 5.3, and with
licensing costs being what they are, I wasn't planning to
upgrade soon. But the multithreading capability is one thing
that has me seriously contemplating it anyway, if it's any good.

ralf

Subject: Re: Multithreading
Posted by Rick Towler on Sat, 16 Mar 2002 01:09:51 GMT
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"trouble" <the_cacc@hotmail.com> wrote in message
news:5f9f0a23.0203140619.479c464c@posting.google.com...
> Yo,

word up.

> Just curious, have many people got good performance gains from
> multithreading in 5.5? I'm on a single processor (drat!).
>
> Anyone like to share their findings - how much improvement, how many
> processors, what kind of programs? What platforms?

Not much exciting news to report in my case.

Dual Athlon MP 1200 on Tyan Thunder k7
512 MB PC2100 DDR
10k RPM Ultra 160 IBM HDDs
Geforce3 video card
Win2k Pro SP-2

I mostly develop OG applications so I wasn't expecting much. What was a
surprise is that by default on win32, IDL will not even split a computation

into multiple threads if the number of elements is fewer than 1000000. There must be a lot of overhead! I did play with this minimum a little but didn't see any benefit with the few applications I tested.

The applications I selected are surely not appropriate metrics to test IDL's multithreading capabilities but I was curious to see if I would benefit in my day to day use.

My first test was time_test_gr2.pro, 3 runs, 1st run discarded:

5.5 completed with a mean total of 45.9 secs per run
5.4 completed with a mean total of 46.2 secs per run

My second test was my own "fishbench" which consists of a 3d model of a fish (in this case lovely walleye pollock #44) and a 3d polygon representing that fish's acoustic reflectivity. There are about 40k triangles total, the models are textured and there are multiple views with text and graphics overlay. This shouldn't test multithreading at all since my "benchmark" doesn't test setup time but only changes the model transform matrix and redraws. This has always been "graphics bound" so don't expect much. average of 3 runs:

5.5 - 25.4 frames/second
5.4 - 25.9 frames/second

The last test was the one I thought would show at least some improvement. I modeled the acoustic backscatter of 4 fish using our kirchoff-ray mode model. This model is like any other: get some data, do some stuff with it, create some output, write it to file. The model makes good use of many of the mathematical and array creation routines that are multithreaded in 5.5. Alas, I don't think that any of the arrays exceeded the minimum number of elements required for IDL to dip into the thread pool. I started to experiment with the new cpu procedure but didn't see any benefits. I will probably revisit this one.

time to model acoustics of 4 fish:

5.5 - 00:02:01
5.4 - 00:02:02

one second is probably well within the margin of error for this highly refined benchmark.

So there you have it. I'm sure there are many who will benefit from

multithreading in 5.5 but I am not one of them.

-Rick

Subject: Re: Multithreading
Posted by the_cacc on Tue, 19 Mar 2002 11:01:40 GMT
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Maybe there really is someone out there getting n-fold speed ups,
however they sure don't want to brag about it...

Ciao.

Subject: Re: Multithreading
Posted by Karl Schultz on Tue, 19 Mar 2002 14:49:35 GMT
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"trouble" <the_cacc@hotmail.com> wrote in message
news:5f9f0a23.0203190301.3c78e195@posting.google.com...
> Maybe there really is someone out there getting n-fold speed ups,
> however they sure don't want to brag about it...
>
> Ciao.

There's quite a bit of information on multithreading on the RSI web site, in the IDL product section. There's an FAQ list and a white paper. The "What's new for 5.5" document contains a list of the routines that are threaded.

Rick, nothing in Object Graphics is threaded, except IDLgrVolume, which was actually threaded before the other threading was added in 5.5. Volume rendering is just one of those things that has a major and obvious payback for a threaded implementation.

Subject: Re: Multithreading
Posted by Rick Towler on Tue, 19 Mar 2002 20:35:05 GMT
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"Karl Schultz" <kschultz@devnull.researchsystems.com> wrote in message
news:a77j60ijh1@news.rsinc.com...

> Rick, nothing in Object Graphics is threaded, except IDLgrVolume, which
was
> actually threaded before the other threading was added in 5.5. Volume

> rendering is just one of those things that has a major and obvious payback
> for a threaded implementation.

Yeah, I knew that. That is why I tried to stress that my "benchmarks" were poor tests of IDL's multithreading. I was just wondering if I would see any difference in my applications which use many of the functions and procedures that are multi-thread aware. I think that this was the intent of the original post.

Since Nigel set me straight on reading some data, I do have some high-res bathymetric data (4.4E6 vertices) which I need to triangulate and run thru trigrid. Since neither triangulate nor trigrid are written in IDL they don't benefit from any of the multithreaded routines. I did notice that min certainly performs as advertised.

I think that the threaded routines are a good starting point. I suspect that with each version more routines will be added and more code will benefit. Until then spend the money on a faster single CPU, more memory, and your IDL maintenance!

-Rick

Subject: Re: Multithreading
Posted by the_cacc on Wed, 20 Mar 2002 11:32:43 GMT
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"Karl Schultz" <kschultz@devnull.researchsystems.com> wrote in message news:<a77j60ijh1@news.rsinc.com>...
> "trouble" <the_cacc@hotmail.com> wrote in message
> news:5f9f0a23.0203190301.3c78e195@posting.google.com...
>> Maybe there really is someone out there getting n-fold speed ups,
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> "What's new for 5.5" document contains a list of the routines that are
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>

Yeah, read it. Just suprised no-one "real" is raving about their performance gains.

Subject: Re: Multithreading
Posted by weitkamp on Thu, 21 Mar 2002 10:42:10 GMT

the_cacc@hotmail.com (trouble) wrote in message
news:<5f9f0a23.0203200332.3d1e3fbf@posting.google.com>...
>
> [...]
>
> Yeah, read it. Just suprised no-one "real" is raving about their performance gains.

Not much to rave about in my case. I mostly do two kinds of numbercrunching. One is Fresnel wave propagation, where the essential operations are FFTs of arrays of size between 1024^2 and 4096^2 pixels. The other is tomographic reconstruction using the RADON function (new in 5.4). I've not had the time to do any systematic investigation on 5.5's multithreading behavior, but here is my experience so far:

For the 2D FFTs, IDL does multithreading, but without a substantial gain in time. Could even be that it takes longer with 5.5 (I tried the same thing with 5.4 and 5.5, the latter being roughly 15 percent faster, but on a CPU with higher clockspeed). Sorry I can't give figures on that and haven't yet tried both 5.4 and 5.5 with the same task on the same machine (had no time) --- I'd be among those who will appreciate if someone else does.

For the backprojection, RADON does not multithread at all (I try this with 2048x2048 slices and 1250 projections for each slice). Given that backprojection is an application where the layman suspects that multithreading should be relatively easy to implement, I was certainly disappointed by that. Seems to be a very commercial decision in that there's definitely more people use FFT than backprojection, and those who don't use any of the two have at least heard about Fourier transforms.

Cheers,

Timm

Timm Weitkamp
European Synchrotron Radiation Facility (ESRF), Grenoble, France