Subject: Re: IDL platform difference
Posted by menakkis on Tue, 30 Mar 1999 08:00:00 GMT
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> Hubert Dietl wrote:
>> I have noticed that IDL for Windows and IDL for MacOS seem to handle
>> some calculations and/or output using float variables differently. I
>> have a procedure that is carrying out a large calculation and printing
>> the results to a file. When I run the same procedure on the two
>> different platforms, I get two different amswers.
<...>

And Christophe Marque <Christophe.Marque@obspm.fr> wrote:
> I have yet encountered the same problem in running a complicated program
> on a Windows NT IDL and a UNIX Digital alpha IDL.
<...>
> I thought the difference was the 2 kinds of processors:
> Intel 32 bits and Dec alpha 64 bits.
> The main trouble is you have the same behaviour when you use double
> floats instead of floats.

I think that the differences seen here are due to differences in FPU
architecture (even though all these platforms store the numbers in IEEE
format *in memory*). The Intel x86 has 80-bit floating-point registers. I
don't know what mac hardware you're using, but I'd bet that it's different.
From what I recall, the Alpha is less than 80 bits. (I think you get what
you ask for on Alpha? - viz. 32-bits for single precision.) So results for
an operation as simple as a single subtraction or addition can differ
noticeably, even in double precision. Even a half-decent compiler will keep
some operands in registers for a while (at least sometimes), so these
differences can easily build up. (Well, there's a compiler option to force
them out to memory straight away, but I don't think IDL is compiled like
this.) So given the nature of the beast, it's risky to rely on *exact*
floating-point numbers, especially across platforms and/or with algorithms
that push the precision.

Peter Mason

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