Subject: Re: Help Large_array
Posted by Brian Larsen on Mon, 19 Feb 2007 21:57:11 GMT
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This is truly annoying at times and I have never found a way around
it.

Have a look at http://www.dfanning.com/misc_tips/submemory.html for a
discussion of this.

Brian

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Brian A. Larsen
Dept. of Physics
Space Science and Engineering Lab (SSEL)
Montana State University - Bozeman
Bozeman, MT 59717

Subject: Re: Help Large_array
Posted by Paolo Grigis on Tue, 20 Feb 2007 08:02:04 GMT
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wx_f@sohu.com wrote:
> [...]
> I need to build a ut=dblarr(36000,500,25) in IDL's pro---sfit.pro.

It is not possible to build such an array with IDL 32 bit version,
no matter how much memory your system has.

Ciao,
Paolo

Subject: Re: Help Large_array
Posted by wx_f on Tue, 20 Feb 2007 09:44:46 GMT
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w...@sohu.com wrote:

>> I need to build a ut=dblarr(36000,500,25) in IDL's pro---sfit.pro.

> It is not possible to build such an array with IDL 32 bit version,
> no matter how much memory your system has.
>
> Ciao,

> Paolo

Mr Pallo
Since ut=dblarr(20000,500,25) and ut=fltarr(36000,500,25)can be
created by my PC(linux_IDL6.0),why it cannot do better(3.6 vs 2,double
vs float)?
a) What's the reason.Could you give a formula to explain
quantitatively?
b) What's the solution to the operation of large array once and for
all(I mean by software not changing hardware)?

thanks
wxf

Subject: Re: Help Large_array
Posted by Paolo Grigis on Tue, 20 Feb 2007 10:53:58 GMT
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wx_f@sohu.com wrote:
> w...@sohu.com wrote:
>
>>> I need to build a ut=dblarr(36000,500,25) in IDL's pro---sfit.pro.
>
>> It is not possible to build such an array with IDL 32 bit version,
>> no matter how much memory your system has.
>>
>> Ciao,
>> Paolo
>
> Mr Pallo
> Since ut=dblarr(20000,500,25) and ut=fltarr(36000,500,25)can be
> created by my PC(linux_IDL6.0),why it cannot do better(3.6 vs 2,double
> vs float)?
> a) What's the reason.Could you give a formula to explain
> quantitatively?

Take the number of elements in your array, call it n.

Take the size in byte of your data type (i.e. 4 for float,
8 for doubles etc.), call it m.

Then m*n is limited to 2^31.

As for the reason, we could speculate that IDL (32 bit) uses
long, signed integers internally to access the memory locations
where the elements of the array reside.

> b) What's the solution to the operation of large array once and for
> all(I mean by software not changing hardware)?

You'll be the one who has to find the best solution suited to
your problem, somehow you'll have to work with smaller chunks
of data.

Ciao,
Paolo

>
> thanks
> wxf
>
>
>

Subject: Re: Help Large_array
Posted by Nigel Wade on Tue, 20 Feb 2007 12:15:07 GMT
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wx_f@sohu.com wrote:

> w...@sohu.com wrote:
>
>>> I need to build a ut=dblarr(36000,500,25) in IDL's pro---sfit.pro.
>
>> It is not possible to build such an array with IDL 32 bit version,
>> no matter how much memory your system has.
>>
>> Ciao,
>> Paolo
>
> Mr Pallo
> Since ut=dblarr(20000,500,25)

this requires 2GB of contiguous memory...

> and ut=fltarr(36000,500,25)can be

this requires 1.8GB of contiguous memory...

> created by my PC(linux_IDL6.0),why it cannot do better(3.6 vs 2,double
> vs float)?

for double it would require 3.8GB of contiguous memory.

> a) What's the reason.Could you give a formula to explain
> quantitatively?

There is a limit to the amount of memory which your OS can address. There is also a limit below this as to the amount of contiguous memory which the OS can allocate to a process. For a 32bit OS the absolute maximum amount of addressable memory is 4GB. But since the OS requires space, and there are likely to be many other running processes which are using chunks of that address space the chance of you being able to allocate 3.8GB of the available 4GB for your array are vanishingly small. There is no quantitative formula for the maximum size of an array which you can allocate, it varies with the amount of memory in use and the amount of fragmentation of the allocated memory chunks. The only rule is that it will be less than the maximum.

> b) What's the solution to the operation of large array once and for
> all(I mean by software not changing hardware)?

There is no solution if your hardware is 32bit. You need 64bit hardware, a 64bit OS and a 64bit version of IDL if you want to use arrays of that size.

--
Nigel Wade, System Administrator, Space Plasma Physics Group,
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Phone : +44 (0)116 2523548, Fax : +44 (0)116 2523555

Subject: Re: Help Large_array
Posted by JD Smith on Tue, 20 Feb 2007 17:27:03 GMT
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On Tue, 20 Feb 2007 12:15:07 +0000, Nigel Wade wrote:

>> b) What's the solution to the operation of large array once and for
>> all(I mean by software not changing hardware)?
>
> There is no solution if your hardware is 32bit. You need 64bit hardware, a 64bit
> OS and a 64bit version of IDL if you want to use arrays of that size.

Or you need to reconsider your methods to use only as much memory as your system can support at a given time, working on data in chunks. ASSOC is one (limited) IDL method for doing this, but there are others. It also really helps if you layout your data such that the pieces which are needed for a given calculation are nearby each other in memory.

JD

Subject: Re: Help Large_array
Posted by liamgumley on Tue, 27 Mar 2007 14:20:35 GMT
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On Feb 20, 7:15 am, Nigel Wade <n...@ion.le.ac.uk> wrote:
> There is no solution if your hardware is 32bit. You need 64bit hardware, a 64bit
> OS and a 64bit version of IDL if you want to use arrays of that size.

The array can be created in 64-bit IDL:

IDL Version 6.2 (linux x86_64 m64). (c) 2005, Research Systems, Inc.

```
IDL> b=dblarr(36000, 500, 25)
IDL> print, memory()
        3600805575              452
134         3600805575
```

Hardware is a Sun Fire V40z with 8GB RAM running 64-bit CentOS.

Cheers,
Liam.
Practical IDL Programming
http://www.gumley.com/