Subject: Re: memory allocation on Macs
Posted by pgrigis on Fri, 02 May 2008 19:13:04 GMT
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Yes, you're right that I can allocate all the 7 GB (and more) in
different IDL
sessions. So there seems to be a limit indeed on how much memory one
single
IDL session (or in general , one process) can use up, but there isn't
a limit for
total usage (which, though I am sure there are a number of technical
reason
for it, seems a bit silly, after all if the system as a whole can
access more
than 4 GB, why shouldn't parts of the system be allowed to do the
same?)

FYI, this is a Xeon machine in Mac OS X 10.4, so it is a 64 bit
processor
in a 32 bit OS running a 32 bit application.

Anyway, thanks to all. I can cope with reading a few arrays off the
disk
from time to time.

Ciao,
Paolo

Karl wrote:
> Yep, a process on a 32-bit OS can only address 4GB of memory. The
> long and complicated discussions about being able to allocate less
> memory on Windows had to do with how Windows partitioned the 32-bit
> virtual address space and virtual address space fragmentation issues.
>
> Is a machine with 7GB of RAM making use of the 7GB, even if the OS is
> 32-bit?
>
> Yes, I think, for OS X with a G5. Note that on this machine with 7GB
> of RAM, you could probably start a second instance of IDL and allocate
> 3 more 1 GB arrays and use them WITHOUT paging.
>
> Some OS's, I dunno about OS X, will cache file I/O in this "extra"
> memory, which greatly speeds up file reads if you read files over and
> over.
>
> I did find an article (2003) that says the G5 can support more than
> 4GB RAM and probably uses it as I have noted above. Note that the
> story may be different for Intel processors. I know that the Xeon can

> address more than 4GB when running a Server version of Windows and
> that's why you see Windows servers built on the Xeon and tons of RAM.
> I don't know if any of this is true for any versions of the P4.
>
> You can also start as many instances of IDL that you want and allocate
> more arrays, but then you'll be subject to a drop in performance due
> to paging and any upper limit placed on the paging file.
>
> The performance hit depends on the memory Working Set of the
> applications that are involved. If these large processes are only
> touching a few pages of memory (unlikely), the performance will be
> very good since all the needed pages fit into RAM. But increase, the
> working set to the point where paging occurs, and the performance
> drops by 2 orders of magnitude, due to paging.
>
> I think Wikipedia has some decent articles on virtual memory OS's.
>
> In any case, if you need a single process size to exceed 4GB, use a 64-
> bit OS.
>
> Karl
>
>
> On May 1, 3:00 pm, pgri...@gmail.com wrote:
>> Yes, I found this on one of apple's webpages:
>>
>> Unlike earlier versions of Mac OS, Mac OS X includes a fully-
>> integrated virtual memory system that you cannot turn off. It is
>> always on, providing up to 4 gigabytes of addressable space per 32-bit
>> process and approximately 18 exabytes of addressable space for 64-bit
>> processes.
>>
>> So if this is true, 32 bit processes cannot access more than 4GB of
>> memory....
>>
>> Ciao,
>> PaoloRick Towler wrote:
>>> pgrigis wrote:
>>>> Hi folks,
>>
>>>> we have pretty much exhausted the topic of memory
>>>> allocation on Windows and Linux, but I don't remember
>>>> any discussion abut this on Mac OS.
>>
>>>> So, I am using IDL 6.3 on Mac OS X 10.4.11.
>>
>>>> I tried allocating as many 1GB array as possible,
>>>> and it failed after 3 successful allocations.

>>>> Now, the "Activity Monitor" indicates that at this point
>>>> I have 3.6 GB of memory used and 3.4 GB free.
>>>> So I am wondering why cant'I allocate a couple more
>>>> of 1GB arrays?
>>
>>> I'm not a macatista, but a quick google search reveals that as of 10.3,
>>> the per process memory limit in OS X is 4GB. That squares with what
>>> you're seeing. Someone more in the know might be able to tell you
>>> if/how this can be tuned. For instance using "setrlimit".
>>
>>> -Rick