

Re: Clustered W2K3 Server Memory

Source:

<http://www.tech-archive.net/Archive/SQL-Server/microsoft.public.sqlserver.server/2005-02/1436.html>

From: Anthony Thomas (*ALThomas_at_kc.rr.com*)

Date: 02/06/05

Date: Sun, 6 Feb 2005 13:47:35 -0600

This is a good one!

Here are two registry keys that you can use to assist you:

HKLM\SYSTEM\CurrentControlSet\Control\SystemStartOptions, will tell you which BOOT.INI configuration was chosen as the current startup.

HKLM\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management\PhysicalAddressExtensions, will tell you whether or not the PAE has been enabled for the current startup.

Now, as to your question regarding SQL Server configuration and Win2K3, /3GB is still required, but there is a new option, /USERVA that will allow you more granularity of control, BETWEEN 2GB and 3GB, but it REQUIRES the /3GB to also be present.

/PAE will only assist you with memory above 4GB. All it does is tell the kernel to use a 36-bit address space, which would give you the ability to address UP TO 64GB, instead of the default 32-bit address space, which will allow you to address up to 4GB. Clearly, a 32-bit address is just a subset of a 36-bit; so, using a 36-bit address space make no sense unless you actually use the 33rd bit or higher.

If you are using SQL Server Standard Edition, SS will never create a Buffer Pool larger than 2 GB, period. However, as I have had this conversation with those here before, SS also uses another memory segment know as MEM TO LEAVE, which is everything above the 2 GB limit but less than the USER MODE address space, minus 512MB x Worker Threads, minus -g startup parameter. UM will be up to 2GB if you have not enabled the /3GB startup option.

So, for SS SE, with the /3GB option enabled and no use of /USERVA, there will be a 3GB VIRTUAL UM address space. SS SE will create a Buffer Pool of 2GB, maximum, but MEM TO LEAVE will be around 1GB - 384MB. If you have sufficient physical ram, then most of this will be real memory, but there will always be some swap space usage.

microsoft.public.sqlserver.server: Re: Clustered W2K3 Server Memory

Now, for Enterprise Edition. What is different here is the ability to use the AWE features, but also, the real Buffer Pool can also be extended to the full UM address space. So, with between 2GB and 4GB of physical memory, you have two options. You can leave AWE disabled, but extend the real Buffer Pool up to 3GB, or, you can enable AWE, use up to 3GB for the real Buffer Pool, minus MEM TO LEAVE, and then use the remainder, up to 1GB, of AWE address space.

With more than 4GB, then you MUST use PAE, whether or not Win2K3 enables this for you or not, use the registry settings to determine if it was detected, but AWE will require PAE to make use of any address space above 4GB. In fact, the OS and SS will not even recognize memory greater than 4GB even exists without PAE enabled.

Hope this helps.

Sincerely,

Anthony Thomas

```
--
"Andrew J. Kelly" <sqlmvpnoospam@shadhawk.com> wrote in message
news:0h%23rZCP9EHA.3236@TK2MSFTNGP15.phx.gbl...
I was pretty sure this was the case although I don't recall ever seeing the
condition of Hot Add memory devices. In either case I think it is worth
placing the /PAE in the boot.ini so there is no mistaking. If it happens to
be there already so be it but at least someone went through the exercise to
ensure it was set. I am almost 100% sure the /3GB is a manual option.
--
Andrew J. Kelly  SQL MVP
"Chris Wood" <anonymous@discussions.microsoft.com> wrote in message
news:eF3yxxN9EHA.2180@TK2MSFTNGP12.phx.gbl...
> Andrew,
>
> I may have found the answer in KB 838765. It mentions under point 6 of
> Workaround
> Note On a computer that is running Windows Server 2003 the PAE
> specification
> is automatically turned on if the computer is configured to use hot-add
> memory devices.
>
> Not sure how I can see if the option is set.
>
> Chris
>
>
> "Andrew J. Kelly" <sqlmvpnoospam@shadhawk.com> wrote in message
> news:unegDGB9EHA.3416@TK2MSFTNGP09.phx.gbl...
>> Well if they try it without the /3GB and it doesn't give you more than
>> 2GB
>> it obviously wont work<g>. I will see if I can dig that up.
>>
>>
>> --
>> Andrew J. Kelly  SQL MVP
>>
>>
>> "Chris Wood" <anonymous@discussions.microsoft.com> wrote in message
```

microsoft.public.sqlserver.server: Re: Clustered W2K3 Server Memory

```
>> news:%23P58gmA9EHA.3236@TK2MSFTNGP15.phx.gbl...
>> > Andrew,
>> >
>> > If you can remember that would be great. I still have to convince one
>> > analyst that we need the /3Gb switch and not the /PAE switch set.
>> >
>> > Thanks
>> >
>> > Chris
>> >
>> > "Andrew J. Kelly" <sqlmvpnoospam@shadhawk.com> wrote in message
>> > news:eAxdW618EHA.1400@TK2MSFTNGP11.phx.gbl...
>> >> I am actually having a brain fart<g> at the moment as I can't recall
>> > what
>> > I
>> >> want to answer you properly. There is something about Win2K3 that it
>> >> does
>> >> automatically but I think it is the setting of the /PAE switch and not
>> > /3GB.
>> >> I believe the /3GB is still required to be set manually.
>> >>
>> >> --
>> >> Andrew J. Kelly SQL MVP
>> >>
>> >>
>> >> "Chris Wood" <anonymous@discussions.microsoft.com> wrote in message
>> >> news:uF$n$w08EHA.3700@tk2msftngp13.phx.gbl...
>> >> > Andrew,
>> >> >
>> >> > Just want to make sure of this as some of our Windows people think
>> > that
>> >> > W2K3
>> >> > is different than W2K for using /3Gb switch.
>> >> >
>> >> > I have reviewed a number of KB article and it is as clear as mud but
>> > I
>> >> > believe that the /3Gb switch works the same way as in W2K and we
>> > would
>> >> > need
>> >> > it in Boot.Ini for SQL to use more than 2Gb.
>> >> >
>> >> > Thanks
>> >> >
>> >> > Chris
>> >> >
>> >> > "Andrew J. Kelly" <sqlmvpnoospam@shadhawk.com> wrote in message
>> >> > news:ufFb8es8EHA.1392@tk2msftngp13.phx.gbl...
>> >> >> Yes the /3GB would be required if you wanted to use more than 2GB
>> > for
>> > SQL
>> >> >> Server. The /PAE is not used until you have > 4GB.
>> >> >>
>> >> >> --
>> >> >> Andrew J. Kelly SQL MVP
>> >> >>
>> >> >>
>> >> >> "Chris Wood" <anonymous@discussions.microsoft.com> wrote in message
>> >> >> news:ez6NyiQ8EHA.2060@TK2MSFTNGP10.phx.gbl...
>> >> >> > Hi,
>> >> >> >
>> >> >> > We have a W2K3 cluster with 3.6Gb memory on each of the 2 servers
>> >> > running
```

microsoft.public.sqlserver.server: Re: Clustered W2K3 Server Memory

```
>> >> >> > SQL2000 SP3A. We have the /PAE switch on in the boot.ini files on
>> > both
>> >> >> > nodes. Is SQL2000 able to use more than 2Gb of memory, with this
>> >> > setting,
>> >> >> > or
>> >> >> > do we need the /3GB switch as well with maybe a /USERRVA setting?
>> >> >> >
>> >> >> > Thanks
>> >> >> >
>> >> >> > Chris Wood
>> >> >> > Alberta Department of Energy
>> >> >> > CANADA
>> >> >> >
>> >> >> >
>> >> >>
>> >> >
>> >> >
>> >>
>> >>
>> >
>> >
>>
>>
>
>
```