

## Re: Clustering Newbie – SAN Advice

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*Source:*

<http://www.tech-archive.net/Archive/SQL-Server/microsoft.public.sqlserver.clustering/2007-11/msg00010.html>

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- *From:* "Geoff N. Hiten" <[SQLCraftsman@xxxxxxxxxx](mailto:SQLCraftsman@xxxxxxxxxx)>
  - *Date:* Fri, 2 Nov 2007 11:51:44 -0400
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What you will need is one or more fibre channel adapters (called Host Bus Adapters or HBAs) in each host computer. These can connect directly to the SAN/Smart array or through a fibre channel switch. The configuration is different for each. Fibre channel is really just a wrapper protocol around the standard SCSI block access protocol, along with a fiber and an electrical (copper) spec.

A SAN generally has gigabtes of cache and uses large internal block sizes and aggressive caching techniques to optimize IO. A SAN can also support many host computers where a smart array is intended to support only a few. SANs are much more scalable. A Smart array does some abstraction of the internal disks, but not nearly to the degree a SAN will.

The SAN or Smart array will dictate what internal connection the disks have. Some have fibre channel (sometimes over copper wire) all the way to the disks. Some have SCSI or SAS attachments to the actual disks.

When dealing with a SAN, the topic of LUN alignment is critical. This is where the OS allocation blocks line up with the SAN internal stripe boundaries. If they are not lined up, the SAN must execute excessive internal IO operations for each physical disk request. This can lose you up to 40% of the IO capacity of the unit.

Whatever you buy, run some IO tests so you will have a realistic expectation and a baseline comparison when the unit is in production.

—  
Geoff N. Hiten  
Senior SQL Infrastructure Consultant  
Microsoft SQL Server MVP

"craig\_amtdatatechnologies@xxxxxxxxxxxxxxxxx"  
<[craigamtdatatechnologiesdiscussionsmi@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:craigamtdatatechnologiesdiscussionsmi@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)> wrote in message  
<news:C485D29A-13F2-4F88-BF41-25C3F4B4B8AD@xxxxxxxxxxxxxxxxxxxx>

Hi,

Thanks for reply, certainly helpful :)

## Re: Clustering Newbie – SAN Advice

I note the need for clarity in nomenclature, correction welcome.

If your (or anyone else), were to put names (not brands) to the bits, what nomenclature should I be using to described the various components and bits connecting them together?

Basically, my knowledge of storage systems is pretty weak (as you wil lhave guessed) ... so I need a connector out the back of my sql boxes (a bit of fibre ... 1 or 2 bits each?), something to plug the fibre cables into (an array), some disks to stick in the array. If fibre connector is used, do these disks need to be anything special?

Sorry for noddy style questions ... !!

Thanks again

"Geoff N. Hiten" wrote:

Lets see.

x64 is definitely the best bang for the buck in the range you are looking at. More memory will help. Put in as much as the box can hold.

Obligatory naming rant: Active/Passive really doesn't describe how things work. You are building a two-node, single-instance cluster. That nomenclature is much more accurate and it scales. (Try describing a cluster with 6 nodes and 12 instances using the words "active" and "passive".)

One very important consideration when building a cluster is to use some type of smart array or a true SAN. The key is that the disk cache must reside in the array, not on an onboard controller. Controller write cache is always disabled in a clustered setting to maintain data consistency.

If performance is key, then RAID 1+0 is the configuration you want. Don't worry about swap files, a properly configured dedicated SQL server should not have any significant paging activity. Do split tempdb onto its own fast disk set.

As for connections, I strongly prefer fibre channel where possible. First, it is a full-duplex data path so you can read and write at the same time. SCSI is a bus so a large checkpoint can hammer read performance. Second, you can only have two nodes in the cluster with SCSI. I am also very reluctant to unplug a SCSI cable on a downed node should I need to repair something. Not so much with a fibre channel connector.

You can always bolt mirroring on top of clustering for some geographic separation. Choosing one does not necessarily eliminate the other.

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Geoff N. Hiten  
Senior SQL Infrastructure Consultant  
Microsoft SQL Server MVP

"craig\_amtdatatechnologies@xxxxxxxxxxxxxxx"  
<craigamtdatatechnologiesdiscussionsmi@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>  
wrote in  
message  
news:130DBB73-7072-4E58-A36D-DFCD35CC6057@xxxxxxxxxxxxxxxxxxxx  
> Hi,  
>  
> We are looking into implementing an Active:Passive SQL 2005 Cluster for  
> a  
> reasonably large and important system (< 1Tb)  
>  
> I'm not looking for advice re: particular brand etc., but on advice on  
> type  
> / type of connection to SAN that may be appropriate. The SQL 2005  
> instance(s)  
> will be x64.  
>  
> Please, any wannabe MVPs do not provide sarcastic/useless answers just >  
> to  
> up  
> your profile. To pre-empt some of these:-  
>  
> Yes I have indexes on current database  
> Yes the queries have been tuned  
> Yes, I have detailed stats on usage, performance, but you do not > need  
> these to answer the general thrust of the question  
> etc.  
>  
> Now, I went through the Dell SQL configurator to see what they came up  
> with  
> .... they suggested £50k would be a reasonable price ... maybe it is,  
> maybe  
> it isn't. This had all manner fancy fibre connection things, disks at  
> £1000  
> each, other buzzers and bells. I wonder if I really need all this?  
>  
> Basic setup is 2 \* servers (Windows 2003 R2, standard, x64), spec'd  
> (each):-  
>  
> 1 \* Quad-core CPU  
> 2 \* 15,000rpm disks (RAID 1) for O/S and SQL program files etc. (and  
> swap files)

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- > 8Gb RAM
- > Network cards, etc.
- >
- > I would like, an external disk array to hold database drives (pretty
- > essential really for a cluster!), of roughly the following format (each
- > physical disk probably 146Gb capacity):–
- >
- > 2 \* 15,000 rpm RAID 1 (tempdb)
- > 2 \* 15,000 rpm RAID 1 (transaction logs)
- > At least 6 (probably more) \* 15,000 rpm Stripped and Mirrored for main
- > database files
- >
- > What sort of storage kit/spec. (fibre? not fibre? etc. ???) should I be
- > looking for to support the cluster? ie. what will do, not what do > HP/Dell
- > etc. wish to sell me.
- >
- > Yes the system wil grow over time.
- >
- > One last thing ...
- >
- > There may be alternative solutions to an Active:Passive cluster, but > some
- > big name players (financial/multinational etc.) are using the system, > and
- > we
- > need to do some serious bomb–proofing.
- >
- > I would prefer to have a single high–performance cluster, to reduce >
- > number
- > of required SQL licences (sorry Bill!), and also avoid having to > maintain
- > too
- > many live copies of the database (yes Mirroring is a cool technology, > but
- > maybe not for me at this moment in time?)
- >
- > Surely an Active:Passive Cluster (even if x64) with external array is > such
- > a
- > basic setup these days, that kit for this is fairly standard?
- >
- > Thank you for reading this, and thanks in advance for any constructive
- > answers/pointers.
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- > Craig
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