



## THIN PROVISIONING – ADVANCED STORAGE ALLOCATION FOR GROWING APPLICATIONS

In certain rapid, high-growth environments thin provisioning can create a storage capacity growth path that delivers on both management goals and capital objectives.

Before implementing thin provisioning, be sure you understand your storage vendor's capabilities, costs, and restrictions.

Thin provisioning is a forward planning tool for storage allocation in which all the storage an application will need is allocated upfront, eliminating the trauma of expanding available storage in systems that do not support online expansion<sup>1</sup>. Because the administrator initially provisions the application with all the storage it will need, repeated data growth operations are avoided. A key result is improved utilization of physical storage resources.

To avoid the inefficiency of over-provisioning, thin provisioning allows the administrator to limit the actual physical storage resource allocation to what is needed now, and enables the automatic addition of storage resources online as the application grows. As a result, the administrator must keep in mind two distinct views of the same volume's allocation – its virtual size (how big it may need to be in the future) and its physical size (how big it is now). This technology is identical to virtual memory in operating systems, in which a process "thinks" it is using a certain amount of memory, but the OS's virtual memory system allocates less physical memory.

### A SITUATIONAL SOLUTION

Because of the two distinct views of storage – a virtual size seen by the operating system, applications, and users, and a physical size seen by the administrator and limited by available physical resources – it is a necessity for all interested parties (application administrators, systems administrators, and sometimes users) to be aware of both the *reality* and the *perception* of available storage resources.

For example, a pharmaceutical company starting a research project may expect its databases to grow 10X over a period of two years. If the administrator immediately provisions all the storage required, an awful lot of storage resources will be spinning unused much of the time – an inefficient use of capital. Increasing storage capacity over and over again may require after-hours work, bringing systems down and disrupting operations each time, since growing some applications requires planned down time for creating new volumes, copying data, and reconfiguring. The administrator has the option of over-provisioning to simplify management, or growing multiple times and suffering the consequences. It's a trade-off of capital vs. management costs.

Thin provisioning can provide the best of both worlds for that application during that period of time. The administrator logically over-provisions storage to the application,

<sup>1</sup> This is described in EqualLogic Coffee Break, "Improving Storage Expansion for Servers and Applications"

but physically provisions only the storage that's needed - growth can occur automatically over time. Now the administrator can achieve management goals without disruption, and achieve capital goals that not only save money but also ensure that you get the advantage of future storage technology advancements.

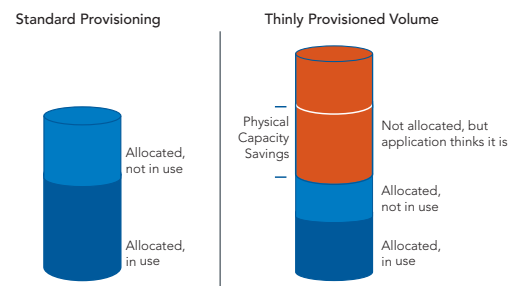
### WHAT TO WATCH OUT FOR

Most important, because of the difference between reality and perception, anyone involved with this storage must be aware of the duality in play. If all players are not vigilant someone could start drawing on the un-provisioned storage - exceeding capacity, disrupting operations, and requiring additional unplanned capital investments.

From a technology standpoint, the basic operations of thin provisioning are similar across vendors - but watch for vendor restrictions and business practices.

- Does the thin provisioning feature cost extra?  
For cost effective management and storage allocation, thin provisioning should be a standard function of the array. EqualLogic provides thin provisioning as a standard product feature, with no additional fees or licenses to track.
- Can you convert data freely between normal provisioning and thin provisioning?  
It is important for administrators to be able to adjust to changing business needs quickly and online. EqualLogic provides the ability to switch volumes online from fully provisioned to thin provisioned and back again, allowing efficient response to changing needs.
- Can you expand thin provisioned volumes - specifically the system (virtual view)?  
If you initially sized (to the server) the volume to 2 TBs, can you expand it? This is important should your estimate of future capacity needs fall short. EqualLogic PS Series arrays enable this capability and more.

- Does the system ensure you can back your thin provisioned volumes as fully provisioned?  
It is important that the system support scaling to allow all thin provisioned volumes to be fully provisioned. Some systems will let you create data sets that could never be fully backed - placing your business at risk if your SAN cannot meet your growth needs.



### IS THIN PROVISIONING RIGHT FOR YOU?

There are several questions to ask before launching thin provisioning in your storage environment.

1. Are you expecting extremely large and rapid data growth?
2. Are you prepared for the more careful management required?
3. Can you easily coordinate with others who need to recognize the reality and the perception of their storage capacity?
4. Do your backup, recovery, and data protection operations work with thin provisioned volumes?

For those who answer "yes" to the questions above, thin provisioning can save time and money, and reduce planned downtime. But be sure to investigate how your storage vendor implements it, if there are licensing costs and restrictions, and if you can easily switch a volume between provisioning models.

To view other Coffee Break Bulletins or to learn more about EqualLogic, visit us at [www.equallogic.com](http://www.equallogic.com).



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