

May 14, 2007

## **Storage Provisioning**

### ***Leaping forward out of the box and into the virtualized storage environment***

*Evaluator Group predicted in early 2006 that this year – 2007 – would be the year that many users would choose a storage virtualization strategy and start to make their choices of vendors for long-term virtualization infrastructure inclusion. Storage virtualization has proven to be a technologically sound offering delivering valuable functions and overall value to the enterprise. However, what about storage provisioning, or thin provisioning, as it is commonly called? Thin provisioning has been essentially contained within a storage subsystem and available within a virtualized storage environment. Some vendors have demonstrated the successful deployment of thinly provisioned storage and the benefits are clear: provision the amount of storage you want, actually use what you need, add more real storage when necessary, and actually reduce the overall power consumption since the real storage is not installed and spinning until you actually need it. But what about applying thin provisioning in the virtualized storage environment? This paper will look at one vendor's approach to applying thin provisioning within a virtualized storage environment – both within a storage subsystem and across multiple attached 3<sup>rd</sup> party storage systems.*

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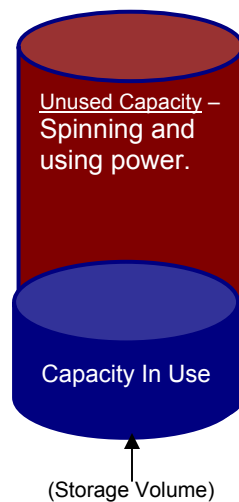
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## ***Storage capacity needs are on the rise; so are purchase and energy costs.***

Storage capacity needs are clearly on an ascending trend. We have all seen the charts and graphs that show linear information growth over the next 5, or 10, years. The point is clear: we are creating, and consuming information at greater rates than anytime in computing history.

Storage purchases and costs are on the rise (in total with management and functional software costs included). With increased storage software functionality helping to fuel storage purchases and the plugging in and powering up of storage systems on the rise by orders of magnitude, as an industry, we have driven the energy usage up to all time record highs for small to medium sized business - and especially for the enterprise data centers with rapidly approaching Exabyte capacity footprints.

As we talk with users, storage administrators to CIO's, we understand the growth in capacity is poorly matched to the actual utilization of the enormous amount of storage devices installed. The cost to manage and run under utilized storage is in some cases staggering. Some users have reported the costs of up to 78% more to run Tier 1 storage than it does Tier 2...and each application user considers his application Tier 1 – making it increasing more difficult for the CIO and storage administrators to convince management the certain applications are less important than others. Considering most capacity is under utilized today, storage can be costly, indeed.



**Figure 1: A typically under utilized non-thinly provisioned volume**

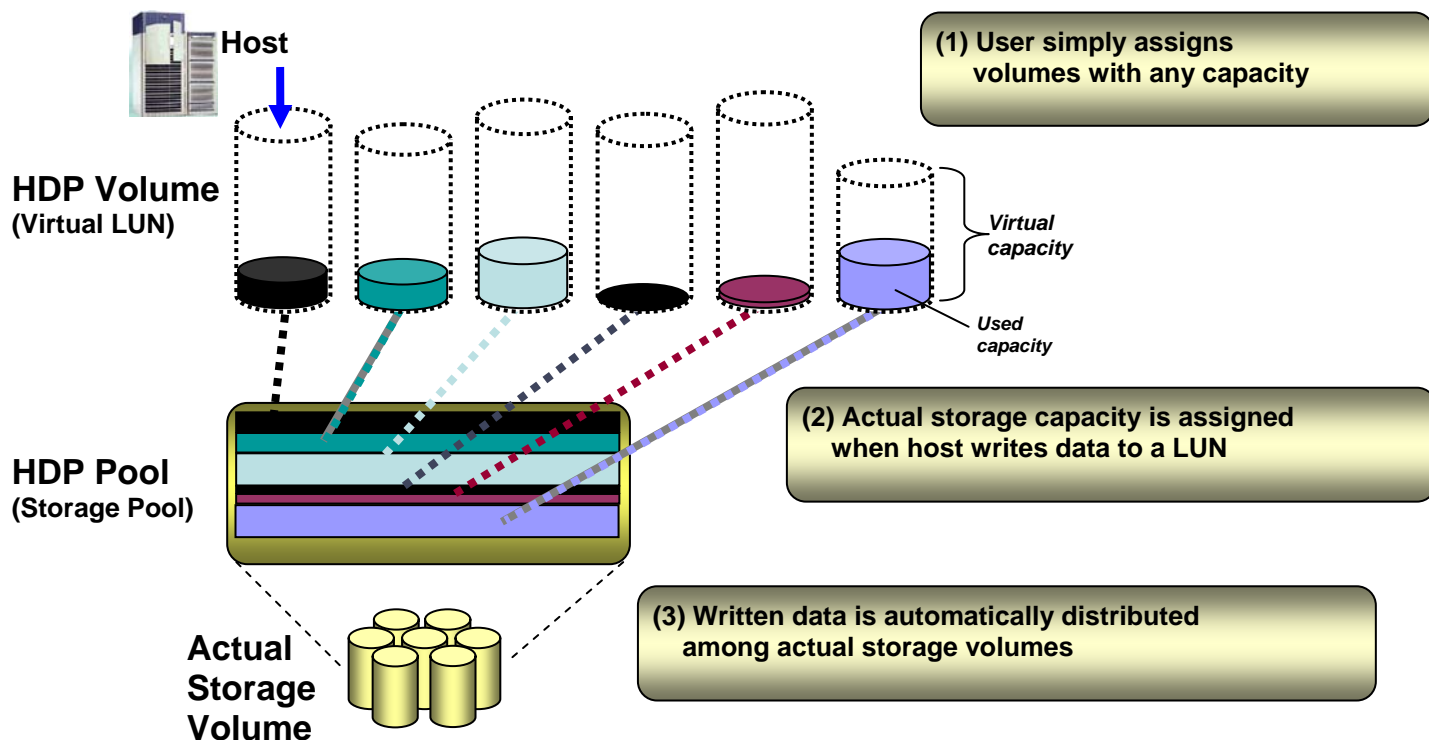
Figure 1, above represents a common problem; purchase storage, utilize a portion of the actual real capacity, and the balance of the real capacity remains under utilized yet still costing real, hard dollars in management and power consumption costs.

One approach to solving the under utilized storage conundrum has been the thin provisioning approach where volumes are provisioned at the actual logical size, however the real physical capacity is much less – providing the user with the ability to actually purchase, manage and power fewer actual disk drives – and install more physical drives as actual capacity demand increases.

**Thin provisioning enables greater efficiencies...  
...Especially in a virtualized storage environment.**

So, it is easy to understand that thin provisioning actually provides real value to the user: less physical storage, install more as you truly need it, and better manage your energy costs.

But what about thin provisioning in a virtualized storage environment? What about both of these technologies available on an enterprise-scale, combined in one integrated solution? Until recently these two credible approaches have not been blended into one viable offering. Hitachi, with its new Universal Storage Platform V is leading what may become the de-facto standard in thinly provisioned virtualized storage environments. Figure 2, below illustrates Hitachi's Dynamic Provisioning Software



**Figure 2: Storage Virtualization blended with thin provisioning**

(Actual storage volumes may exist within the USP, or, in the near future, as attached 3<sup>rd</sup> party physical storage)

## Summary

As storage virtualization evolves, it is natural to add more capabilities to the virtualized environment. Can users obtain thin provisioning without storage virtualization today? Yes, there are solutions that are available that fit specific user requirements. However, for users who are looking for enterprise-class virtualization and the ability to apply thin provisioning both within and externally to the virtualization controller, then they should consider leading-edge solutions that may fit these requirements, such as Hitachi's newly announced USP V. Will the blended virtualization and thin provisioning fit all requirements, of course not. However, for those data centers where multiple vendor shops will continue to co-exist, virtualization and the leverage of thin provisioning offers

significantly better storage utilization and lower power consumption characteristics—two highly important characteristics for which storage administrators and data center operations personnel strive.

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