Peer Incite

Notes from Wikibon's Weekly Storage Research Meeting

Storage Virtualization   **March 26, 2007**

In This Issue

Storage virtualization: Take advantage without being taken

Storage virtualization: One size won't fit all

Storage virtualization: Think conumer act enterprise

Storage virtualization: Technology constraints

Storage virtualization has services gorillas licking their chops

Storage virtualization: Don't try and buy on the fly

Weekly Research Meeting

Quick Links

Newsletter Signup
Research Calendar
Podcast
Previous Notes
Wikibon.org

Dear David,

Welcome to Peer Incite, Wikibon's weekly storage newsletter. This week David Floyer presents ***Storage virtualization: Take advantage without being taken.*** Storage virtualization is enabling a whole new approach to infrastructure management that threatens many established assumptions in the enterprise.

We've tried to make this newsletter about your business and we invite you to not just read but also ***contribute*** to these articles. Wikibon is about doing good work with peers so feel free to improve a research note. Simply click on the article link and hit the 'edit' tab to make the piece better. Please log in before making edits so you can receive attribution for your good work. Thanks for reading - Bon!

David Vellante

Storage Virtualization: Take advantage without being taken

-Peter Burris and David Floyer

Storage remains the wild west in the data center. Over the last number of years, the rate of growth of storage resources has been extraordinary, driven by applications that have a greater thirst for more, larger files and a diversity of performance requirements. Recently storage vendors have been introducing storage virtualization technologies to try and help user organizations gain greater control over how they configure, move, administer and ultimately handle resource utilization of these storage assets.

These technologies ultimately provide three views that lead to distinct and very real benefits:

1. A user view that allows individuals and developers to identify the specific storage resources under their control.
2. A resource management view that provides a vehicle for mapping resources to capabilities at a delivery level.
3. An operational view that effectively handles the ongoing arrangements of one-time resources required to deliver committed services at the storage level.

The benefits of storage virtualization can be significant, dramatically cutting the cost of configuring storage and moving data, simplifying the handling of resource utilization decisions and even addressing accounting questions regarding how much an application, user or group utilizes storage at different performance levels.

However, even as the these technologies prove increasingly beneficial and powerful, user organizations must be very careful to note that the front side (services-side) virtualization work is not trivial. Servers, files and other types of resources must be discreetly named and identified so that a robust virtualization set of resources can be defined and administered in an ongoing way.

The metadata associated with establishing these virtualization structures will become a significant source of value to users as well as vendors. Over the next few years, users should begin utilizing virtualization technologies in application domains where the cost of configuration, movement and administration of storage are extremely high. All the while pushing their suppliers to find new and more meaningful ways to simplify and ultimately unify technologies for handling the front side virtualization metadata and resources.

Action Item: User organizations should begin exploiting storage virtualization technologies in those application domains where the cost of storage configuration, movement and administration are very high and represent a serious risk and cost item in application performance. However, as users begin to exploit these technologies, they must always configure a transition plan before configuring their backside (delivery – i.e. devices and infrastructure services) virtualization technology stack.

Storage virtualization: One size won't fit all -Dave Vellante

Storage virtualization promises enormous gains in effective utilization, management efficiencies and provisioning flexibility. Our models suggest meaningful improvements in the typical metrics used to track such performance (e.g. effective utilization percentage, cost to manage and time to provision storage) leading to 50%+ reductions in total cost of ownership (TCO). That's good news and storage professionals should view virtualization as a fundamental capability of storage architectures.

While there are lots of adoption hurdles to overcome, including the 'black box' stigma attached to storage virtualization, sharing physical assets across multiple logical resources will make lives easier if done properly. Setting expectations is part of successful adoption and heterogeneity is one area where users must separate fact from fiction. The fact is that true heterogeneity is a long ways off.

Today, while it is possible to virtualize heterogenous arrays under a single point of control, you must commit to a single in-controller virtualization architecture to do so. As well, users must ask what this means for existing and future storage resource management (SRM) investments and how to manage exit strategies. Unfortunately, it is unlikely that a single virtualization approach is practical from a business perspective any time soon.

Action Item: Users need to act now to begin taking advantage of storage virtualization. Like many beneficial technologies virtualization is a story of 'horses for courses' in that different virtualization strategies will best fit different workloads. Be prepared to architect multiple virtualization approaches in storage architectures (based on strategic fit), recognize lock-in strategies and plan for transitions as new approaches come on line.

Think consumer act enterprise - David Floyer

Companies like Xdrive offer 50 gigabytes for $10/month which includes server and back-up costs. Xdrive knows that the majority of its customers will use less storage than allocated and it prices the service accordingly. Increasingly, Goliaths like Google and Microsoft are gearing up to provide application and storage services that will be attractive to user departments. Many applications with large amounts of storage will be candidates for these services, especially those with external communication (e.g., email).

IT departments need to understand how and when they will be competitive with these types of storage services and find ways to qualify and offer them to clients where it makes business sense. Service-side and delivery-side virtualization implementations are key enablers. In addition, IT must focus on adding services that provide the enterprise functionality and protection that consumer companies are unlikely to provide.

Action item: User departments will demand consumer-like services that provide simple interfaces, reasonable service levels and transparent costs and usage metrics. IT should qualify and offer such services to leverage emerging consumer service infrastructures and focus on aligning internal resources to areas these providers will not address. This includes providing additional enterprise services such as very fast recovery through snapshots, recovery with zero data loss, remote replication and highly specific application functionality.

Storage virtualization technology constraints -David Floyer

The four main virtualization architectural options are storage controller-, server-, network attached appliance-, or storage fabric-resident function. All architectures work well for I/O light environments where recovery is less complex, but for most situations, the choice will be using virtualization appliances or solutions where virtualization is built into the storage controller.

The advantage of appliance-based virtualization is it cost-effectively unifies virtualization methodologies, theoretically enabling the mapping of heterogeneous storage. The big drawback here is that because storage management services reside in each respective controller, the locus of control is shared between appliance and storage controller. This makes storage management more cumbersome for the system. Additionally, while appliance-based approaches can accommodate heterogeneous storage, they only allow virtualization within each homogeneous storage sub-pool, cutting off the heterogeneous vision at the knees.

Having multiple points of control (e.g. different storage controllers and appliances) creates potential bottlenecks in high I/O environments, especially during recovery. This is where controller-based virtualization shines. With a single point of control, virtualization within a high performance storage controller enables the attachment of heterogeneous storage arrays and logical mapping across all attached assets. Whatever path is taken, there will be some degree of vendor lock-in, especially at the storage resource management (SRM) level.

Action item: Keep the initial environments for virtualization as simple and homogeneous as possible with single vendor solutions; consider different virtualization approaches for different storage pools-- one size does not fit all. For high performance and high availability environments there are strong theoretical and practical reasons for putting the virtualization engine in the storage controller. For other environments the choice is wider.

Storage virtualization has services gorillas licking their chops

-Dave Vellante

Peter Burris called today exclaiming that he'd just bought a 500GB disk drive for $189. At $0.04 per megabyte, he reasoned, that's about what it costs to store one minute of audio on a hard drive-- about the same as dialtone.

Xdrive sure understands this. It will sell you 50GB's of storage per month for $10. It doesn't take long for Xdrive to break even on that deal. What's more, if Xdrive sells 50 virtualized gigabytes, anything you don't use they can sell to someone else-- double dipping on the unused physical capacity.

If Xdrive gets this, you can be sure Google and Microsoft do too. Vendors with easy-to-use software based on the principles of virtualization are delivering cost effective services that meter capacity available, capacity utilized, cost per month and security levels. Recovery objectives are not far off. I know application and business owners who crave for this level of simplicity and transparency.

Action Item: Consumer-oriented services companies are encroaching on the domain of established storage vendors using highly scalable business models and technologies like virtualization as the underpinning of their competitive strategies. In order to recoup substantial software R&D investments, established storage vendors will have to either compete head on with their own services business models, flee to high ground transaction-oriented mission critical businesses or both.

Storage virtualization: Don't try and buy on the fly -Peter Burris

Adopting storage virtualization technologies can deliver significant benefits, but will feature multiple challenges and risks. The greatest risk will be social: cohering an organization's disparate views of storage requirements and performance attributes into a common set of capabilities that can be structured as storage services to be delivered through virtualization. The metadata management technologies and operational/administrative practices adopted will be the real lynchpins to storage virtualization success, eclipsing any hardware-related value proposition. Often, IT organizations default to the control processes and metadata dictated by a product set's management software; that's the easiest path to exploiting products. However, in the case of storage virtualization, it's also the certain path to long-term vendor lock-in. To avoid onerous long-term dependencies on one or another storage virtualization path, users must establish independent rules, roles, responsibilities, and data structures that can accommodate multiple storage virtualization strategies, and not constrain themselves to "out-of-the-box," implied knowledge.

Action Item: To remain in control of storage resources under storage virtualization routines, users must emphasize the transfer of knowledge about storage virtualization metadata and practices over the transfer of products, either hardware or software.

Weekly Storage Research Meetings

Each week, Wikibon hosts a research meeting covering important topics of the day. Moderated by former Meta Group Co-research Director Peter Burris, the weekly research meetings address organizational, technology integration, user and vendor issues and the all-important "how do I get rid of this stuff?"

Please join us for these one hour sessions that are always 'inciteful.' >>Learn more

Next WeeK: Data Classification
Analyst: Dave Vellante

Forward email