



Application Virtualization and Utopia: Proving the Value of Virtualizing Applications

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VIRTUALIZATION CONFUSION

Virtualization has become a major catch phrase being bandied about in the business and IT-oriented media today. Due to an amazingly successful marketing campaign by a major supplier of one type of virtualization technology, the media, consultants and some analysts mistakenly equate virtualization with virtual machine software. In reality, virtualization is far more.

What is it really? Virtualization is the use of hardware and software technology to present a logical view of resources to developers, administrators, operators and system users. This logical view is often strikingly different than the actual physical view.

What does this really mean? System users may see a single physical computer as if it were many different systems running different operating systems and application software. Or they may be presented the view that a group of systems are actually a single computing resource. Other virtualization technology may allow individuals to access computing solutions with devices that didn't exist when developers created an application. It may also present the image that long obsolete devices are available for use in the virtual environment even though none are actually installed.

In the end, the appropriate use of these layers of technology offer organizations a number of benefits including improved levels of scalability, reliability and performance, far greater agility than possible in a physical environment and more optimal use of hardware, software and staff resources.

Virtualization technology makes it possible for many different computing resources to be viewed in a logical, not a physical way. Access, applications, processing, storage and network resources can be made to live in an artificial environment that is secure and well managed.

This paper focuses specifically on application virtualization, the organizational pain that it addresses, the benefits of its use and the utopian world it can create.

A USEFUL TOOL THAT MAKES VIRTUALIZATION CLEAR

Since so many have been confused by all of the hype in the market, The Kusnetzky Group has developed a tool, a pattern or model, to help its clients understand virtualization in greater detail. Figure 1 presents this model.

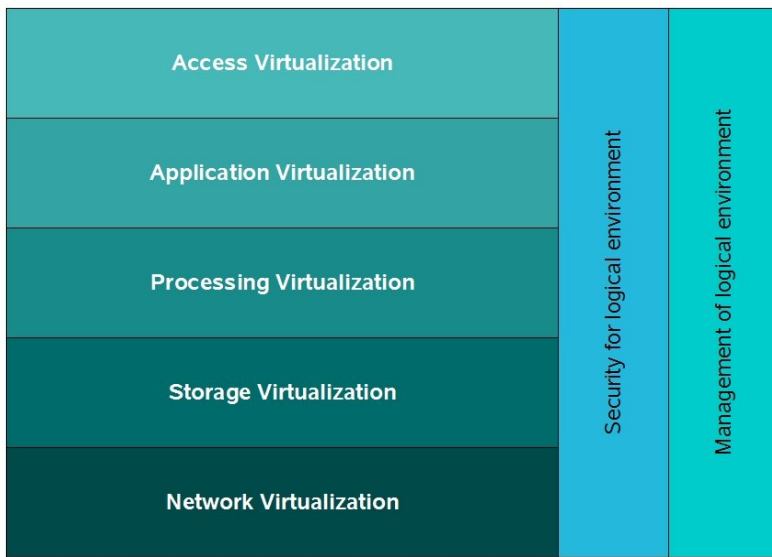
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There are many layers of technology that virtualize some portion of a computing environment depending upon whether the organization is seeking performance, reliability/availability, scalability, consolidation, agility, a unified management domain or some other goal. Let's look at each of them in turn.

Access Virtualization - hardware and software technology that allows nearly any device to access any application without either having to know too much about the other. The application sees a device it's used to working with. The device sees an application it knows how to display. In some cases, special purpose hardware is used on each side of the network connection to increase performance, allow many users to share a single client system or allow a single individual to see multiple displays.

Figure 1 Virtualization Technology



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Application Virtualization - software technology allowing applications to run on many different operating systems and hardware platforms. This usually means that the application has been written to use an application framework. It also means that applications running on the same system that do not use this framework do not get the benefits of application virtualization. More advanced forms of this technology offer the ability to restart an application in case of a failure, start another instance of an application if the application is not meeting service level objectives, or provide workload balancing among multiple instances of an application to archive high levels of scalability. Some really sophisticated approaches to application virtualization can do this magical feat without requiring that the application be re-architected or rewritten using some special application framework.

Processing Virtualization - hardware and software technology that hides physical hardware configuration from system services, operating systems or applications. This type of Virtualization technology can make one system appear to be many or many systems appear to be a single computing resource to achieve goals ranging from raw performance, high levels of scalability, reliability/availability, agility or consolidation of multiple environments onto a single system.

Storage Virtualization - hardware and software technology that hides where storage systems are and what type of device is actually storing applications and data. This technology also makes it possible for many systems to share the same storage devices without knowing that others are also accessing them. This technology also makes it possible to take a snapshot of a live system so that it can be backed up without hindering online or transactional applications.

Network Virtualization - hardware and software technology that presents a view of the network that differs from the physical view. So, a personal computer may be allowed to only see systems it is allowed to access. Another common use is making multiple network links appear to be a single link.



Management of virtualized environments - software technology that makes it possible for multiple systems to be provisioned and managed as if they were a single computing resource.

T O D A Y ' S P A I N ?

Organizations are facing a very challenging environment and must make the best use of their resources.

DOING MORE WITH LESS

An organization's environment now is dynamic and changing. The demands upon IT resources vary from moment to moment, day to day and planning has become increasingly challenging.

Customers have increasing expectations that an organization's applications will offer customized solutions for them and that these applications will make immediate use of new technology. New technology is appearing at an unbelievably accelerated pace and the organization's executives, having just read a business publication, want to know when some of that new technology is going to be deployed in the organization. Suppliers of technology appear almost daily who present customers with new products and product features. Regulatory agencies are making demands that require the IT organization to develop and deploy applications that allow rapid reporting of financial results on a quarterly or annual basis. In the end, IT-administrators find that workloads are constantly changing making it hard to keep up.

Organizations are challenged with reducing their overall costs in the quest to stay competitive in a global marketplace. This has led them to implement stricter IT budgets and expect the IT department to still provide the same level of service as before or they've keep the budget the same year-to-year while expecting IT services to somehow increase.

This conundrum has faced IT planners for several years in a row. So, this dynamic, ever-changing environment is being managed by fewer people and the cost of failure is dramatically higher.

I PAID FOR IT, WHY CAN'T I USE IT?

Many organizations are dealing with the result of allowing their IT-infrastructures to grow without a well-researched, well designed plan. Because there was no overarching plan, each business unit or department selected systems and software to satisfy only its own needs and handle only the ebb and flow of its business.

So, as a result, systems and software were purchased with an eye only towards making sure that there would be sufficient resources necessary to support their own workloads. Since those resources ended up sitting in "computing silos," idly waiting for peak periods, they're not available for day-to-day processing requirements. The organization paid for these resources and yet, much of the benefit they could be providing is wasted as the systems run the idle loop in the operating system.

IN THE END, I PAID TOO MUCH

This silo-based thinking lead to servers being utilized only 15% to 20% of the time. If it were possible to orchestrate and optimize the use of system resources to support the ebb and flow of the entire organization's workloads, it is very likely that a smaller number of systems would support the organization and offer room for reasonable growth. In today's world, most organizations have paid too much for their IT infrastructure.

APPLICATION VIRTUALIZATION TO THE RESCUE

Over the last couple of decades, virtualization technology has been developed to address these very issues. It is called “application virtualization” (see figure 1). It is software technology allowing applications to run on many different operating systems and hardware platforms. More advanced forms of this technology also offer the ability to restart an application in case of a failure, start another instance of an application if the application is not meeting service level objectives, or provide workload balancing among multiple instances of an application.

The goals here are decoupling applications from their underlying computing resources, aggregating the resources into a pool and then allocating computing resources in a better way from that pool.

How can application virtualization help?

ORCHESTRATING RESOURCES

Application virtualization technology can review the resources needed by all of the applications in its care, the resources that are actually available, an organization’s policies and service level objectives and then orchestrate the use of resources to dynamically meet the organization’s requirements using a smaller number of systems. This can be done in real time, without requiring manual intervention.

OPTIMIZING RESOURCES

This means that automation can be applied to the processes of installation, configuration, managing, monitoring, resizing and/or upgrading of resources on a moment-to-moment basis. It would also be possible to transfer applications to a smaller number of servers during off-peak times and allow staff to turn off unused systems to reduce power consumption and heat production. This, by the way, is at the heart of the concepts of “green computing” and “green data centers.”

PROVING VALUE

In this utopian world, application virtualization technology could be measured by the value it produces for the organization. It would mean that the organization would be operating at a higher level of “business readiness.” Once installed and put to work, this technology could provide tangible benefits in a very short order. The expected benefits follow.

IMPROVED PERFORMANCE

Since the use of available resources is constantly being orchestrated and optimized, the organization could expect the best possible levels of performance that is possible. High-priority workloads could be moved to the fastest machines and given access to larger amounts of memory and network bandwidth. Lower priority workloads could be moved to slower system, work with reduced memory or limited network access.

COST REDUCTION

If a smaller number of systems could actually support the ever-changing workload of the organization, the organization could expect savings in the areas of hardware costs, software costs and in the staff-related costs of administration, operations and support.

THIS VISION CAN BE IMPLEMENTED NOW

What’s exciting to know is that this utopian vision can be implemented today with today’s tools. Organizations can obtain the benefits mentioned in this paper with virtualization technology that is available today in products, such as DataSynapse’s FabricServer.



The Kusnetzky Group knows of many successful implementations of application virtualization using products from several suppliers. One case that highlights the potential benefits follows. The company being reviewed was trying to Increase agility and gain a competitive edge by moving to a service oriented architecture (SOA) framework that included packaged applications. This company had an application portfolio of over 1,000 applications. As a result of using DataSynapse's FabricServer, the company was able to realize the following benefits.

- ☒ An 8 figure (\$) increase in NEW business the first year
- ☒ A high 7 figure cost avoidance per annum including a 30% minimum cost avoidance for unneeded additional application servers and licenses
- ☒ A 500% improvement in application responsiveness
- ☒ A 50% increase in throughput

IT decision-makers who are grappling with the issues mentioned in this paper would be well advised to learn more about how products of this type could help them meet their objectives while lowering their overall costs of computing.

For more information, please visit

http://www.datasynapse.com/Webcast_BI_Series1_lp.aspx