

Demystifying Virtualization

What is virtualization?

Simply put, Virtualization is about sharing resources of a single computer across multiple environments and users. Virtualization helps increase the utilization and flexibility of hardware by making it possible to run multiple operating systems and multiple applications on the same computer at the same time. A more radical way of thinking is of virtualization as a method that allows you to transform hardware into software.

Who can benefit?

Anyone who uses a computer can benefit from virtualization. It saves time, money, energy and helps people achieve more with the computer hardware they already own. Software such as VMware ESX helps transform or virtualize the hardware resources of a computer including the CPU, RAM, hard disk and network controller to create a fully functional virtual machine. Multiple virtual machines share hardware resources without interfering with each other so that several operating systems and applications can be run at the same time on a single computer.

For small to mid size organizations, there are several benefits of virtualization that are direct and upfront – reduce costs of IT staff, get a service provider to remotely provision a range of services covering hardware, storage, backups, content filtering, patch management, license management, information security and several other such everyday uses priced as utility bundles from a managed service provider. The biggest benefit will be that of having enterprise class IT assets and services at a affordable pay per use pricing model which will help such companies reduce their 'sunk costs' into large IT assets that will obsolete soon.

Levels of virtualization

While a single computer can be easily virtualized, software such as VMware also allows creation of a robust virtualization platform that can scale across several interconnected computers and storage devices to form a virtualized infrastructure. Virtualization helps create pools of dynamic resources with unlimited capacity available to users at anytime.

Virtual computing vs. Static computing as defined by Microsoft address several key differentiators – key examples are Virtual presentation (user interface separated from O/S), Virtual applications (on demand applications), Virtual operating system (can be assigned to any hardware), Virtual storage (storage and backup on the network) and Virtual network (localization of dispersed resources).

Virtualization can be thought of at desktop, data center and network levels. The biggest aspect is that of a user mind shift in terms of reliability of service levels from service providers. However, given that we have been using similar analogous services for several years (such as telephony and other utility services), virtualization is no different except for the intellectual property that is stored at a remote location, which whilst appropriate from a business continuity issue, can still be a key decision factor.

Advantages of virtualization

With computing becoming more ubiquitous, powerful and portable, virtualization is an obvious part of the roadmap as users look to more of 'managed services' that span across hardware and software. With virtualization, one can leverage a powerful combination of hardware and software 'on tap' truly leveraging the power of the internet.

Today, one can also see emergence of a new class of devices from several hardware vendors called mini note books or a combination of converged devices that include a phone as well that are very well positioned to leverage virtualization. Since a lot of the 'heavy duty devices' such as memory, storage, backup etc are virtualized, it is truly possible to have light and small form factor access devices that are truly powerful and allow users to have access to all of their digital assets on the go!

The biggest advantage of virtualization is cost reduction since computing resources are optimally shared and better utilized than concentration of individual assets. The biggest cost impact is energy efficiency. Conceptually, most of us have already been virtualization in some form or the other such as hosted email applications, web hosting, Google apps, Zoho and hosted storage to name a few. Virtualization also helps optimize software costs significantly since all users do not use all applications at the same time and as needed additional licenses can be provisioned quickly. The same concept can be extended to hardware assets as well with a little forward planning (e.g. storage). Microsoft's system center will allow management of both physical and virtual assets for clients and servers including the ability to manage multiple hypervisors.

The last word....

Therefore, while you virtualize, you also improve your cash flows by reducing fixed assets, space and people....So, if you are interested in further abstraction of your computing resources, here is some jargon that you can check out – full virtualization, hardware assisted virtualization, Para-virtualization, Channel bonding, Encapsulation, Grid computing, Logical volume management, Partition computing etc.