

# The virtue of virtualisation

From complex mainframe systems to single purpose servers of the late 90s, computer server technology has continually adapted to meet the changing demands of business.

However, certain challenges remain. For example, x86 chip architecture servers and operating systems struggle to run multiple applications efficiently. This creates a reliance on single purpose servers when building IT infrastructure for medium to large-sized businesses.

The result? Inefficient and under-utilised server hardware that costs the business time, money and physical space.

## Maximising the power of the chip

In 2001, VMware released ESX – a hyper-visor that harnessed the full power of the x86 chip and changed the way servers were deployed forever.

The ESX hyper-visor enabled multiple operating systems to run on a single piece of hardware, and allowed Linux and Windows to run side-by-side on the same server.

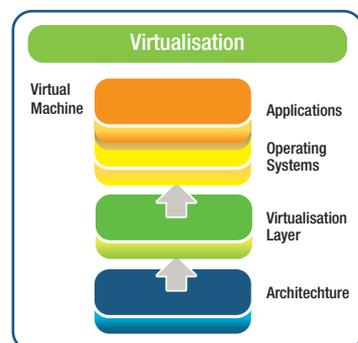
What's more, ESX provided high availability (HA) support, plus the ability to move most 'live' servers without data loss or service interruption. Multiple guest operating systems could now run across multiple physical servers, with reliable backup in case of server failure.

Overall, businesses were now able to run many different operating systems on a minimum number of physical servers, creating greater cost and time efficiencies.

## So what is virtualisation?

In traditional computer set-ups, the operating system (OS) has direct access to the hardware, including the CPU and memory. Virtualisation is the abstraction of this hardware from the OS.

The early stages of virtualisation began in most x86 servers with the introduction of the Hardware Abstraction Layer (HAL).



Hyper-visor technology such as VMware (who added support for 64-bit extended x86 platforms in 2004) and Hyper-V, has taken things a step further. This technology not only enables complete separation of the OS from the hardware, but also the ability to share that hardware with multiple operating systems.

## Key benefits of virtualisation

Virtualisation technologies provide your business with a number of benefits, including:

-  Reduction in physical servers and rack space.
-  Fast replication and recovery of server OS.
-  Reduction in power and cooling as a result of fewer servers.
-  Reduction in hardware maintenance and replacement.

The obvious benefits centre on cost efficiencies and the reduction of physical space requirements. By eliminating the need for multiple single-use physical servers, virtualisation technology can streamline your IT infrastructure and save your business significant amounts of money.

There are many other specific benefits of adopting virtualisation technology, as follows:

-  **Scalable** – leverage existing IT infrastructure in secure data centres, and expand your IT environment without the need for expensive on-site physical servers.
-  **Flexible** – as a guest OS running on virtual hardware, you can quickly and easily move from one server to another in case of failure. This is not possible with stand-alone single-use servers.
-  **Intelligent** – enjoy the efficiency and simplicity of less physical servers with more virtual rack space.

## The virtualisation revolution

Until recently, establishing a virtual server environment to replace multiple physical servers was something only large corporations with large budgets could accomplish.

However, there are now three revolutions taking place that allow businesses of any size to take advantage of virtualisation, namely **cloud based services**, **the moving desktop** and **application virtualisation**.



### Cloud based services

Flexible, cost effective and highly scalable, cloud based virtual servers are revolutionising the way businesses manage their IT requirements.

The cloud allows you to leverage a hosted virtual server environment with minimal capital outlay, by using the infrastructure already built by others.

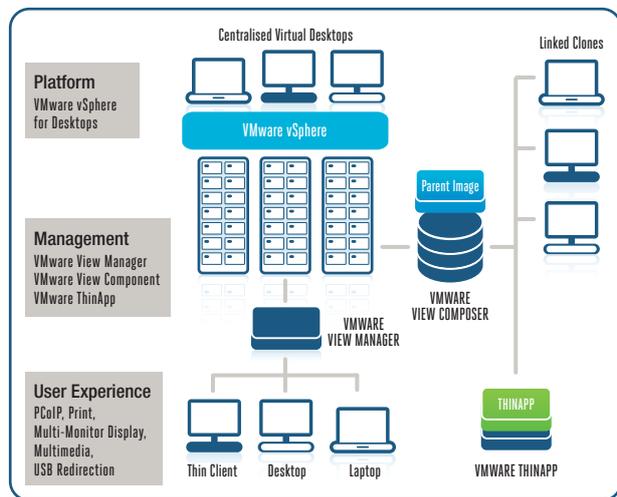
You can also establish a hybrid IT environment where parts are hosted in the cloud and other parts maintained on-site e.g. hosted/cloud based exchange solutions, which eliminates the complexity of setting up an MS Exchange email environment, while still maintaining in-house file and print services.

### The moving desktop (VDI)

Thin client interfaces allow you to access your desktop from anywhere in the world. However, traditional thin client technologies have many limitations, including:

1. Installed programs are available to all users across a shared environment, unless carefully controlled through complex setups.
2. Resources available to each individual user cannot be varied. The more people that connect to a thin client server, the more stretched the resources become.

Nowadays, these problems are alleviated with virtual desktops e.g. one user can have speciality accounting software installed, whilst another user can have Adobe CS5 Premium design suite installed. Differing amounts of memory and CPU can also be allocated according to individual desktop needs.



### Application virtualisation

Application virtualisation allows you to encapsulate an application as if it were part of the OS. The application is “tricked” into believing that it is interacting directly with the underlying OS and its resources.

Application virtualisation delivers the following benefits:

- Runs applications in environments that do not suit the native application.
- Protects the OS and other applications from poorly written code.
- Runs applications that are not written correctly.
- Runs incompatible applications concurrently.
- Maintains a standard configuration in the underlying OS across multiple sites.
- Removes the requirement for end-users to have administrator privileges.
- Simplifies OS migrations.
- Accelerates application deployment through on-demand application streaming.
- Improves security by isolating applications from the OS.
- Tracks license usage to help save on license costs.
- Fast application provisioning to the desktop based on user's roaming profile.
- Allows applications to be copied and imported without re-installation.

### Setting up your own virtual server environment

For those looking to establish their own virtual server environment, there are some important points to consider:

1. You may need to invest in a multi-core, multi-processor systems, with large amounts of RAM, depending on the size of your implementation.
2. You will need sufficient disk space to store guest operating systems and data. This can be achieved by building a Network Attached Storage (NAS) device or Storage Area Networks (SANs) for your virtual environment.
3. Compatibility of hardware is crucial in order to utilise high availability services. Mixing chipsets can cause problems, such as when you wish to fail-over a live OS from one server to another.
4. Whilst moving to enterprise level capabilities and acquiring VMware software requires a large upfront investment, virtualisation delivers significant cost benefits over time.

If you're not in a position to establish your own virtual server environment, it's wise to partner with someone who can build or host it for you on existing VM infrastructure.

### Conclusion

The world of virtualisation may seem complex, however it's clear that moving to a virtual IT environment can deliver many cost and efficiency benefits to your organisation.

And with emerging technologies such as cloud based services, moving desktops and application virtualisation helping to create a streamlined, responsive and flexible virtual environment, your business will be well positioned to capitalise on future growth opportunities.

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