

THE BASICS OF VIRTUALIZATION

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Within the context of computing, Virtualization is a broad term used to encompass the methodology or technique of using bare-metal hardware [servers] to host several independent and isolated *virtual* environments in parallel as opposed to an *actual* environment on a single instance system. The hardware and virtualization software are the *host*, the operating system is the *guest*, and each isolated environment is referred to as a virtual machine, or *VM*.

The diagram below represents a traditional server configuration versus a virtualized server.

ONE TO ONE ACTUAL	FIVE TO ONE VIRTUAL				
APPLICATIONS	DC OS	Citrix OS	Exchange OS	Storage OS	SQL OS
OPERATING SYSTEM (OS)	VIRTUALIZATION SOFTWARE				
HARDWARE	HARDWARE				

Virtualization technology gains have been outpacing industry predictions since 2005. The faster than normal adoption of the virtualization methodology is fueled by underutilized hardware, server room space constraints, energy consumption concerns, business continuity and disaster recovery initiatives, and the overwhelming prospect of growing IT management overhead.

A virtualized server is capable of hosting a wide range of previously incompatible operating platforms and line-of-business applications simultaneously while making efficient usage of a shared hardware host. For example, you can run 32-bit Windows Server® 2008 with Citrix® XenApp™, 64-bit Microsoft® Exchange Server® 2007, UNIX Apache HTTP Server, and a Windows XP® Professional desktop environment all on a single chassis. Couple virtualization technology with space and energy saving blade servers and you can effectively reduce the footprint of your rack-mounted hardware by as much as 70%. Your capacity and expansion capabilities are limited only by the host hardware specifications and the licensing model of the virtualization technology that manages the images.

Business Continuity initiatives are arguably the most significant contributor to the rapid adoption of virtualization technology. Business Continuity Planning is a methodology used to create a plan for how an organization will resume partially or completely interrupted critical network functions after natural or man-made disaster or disruption. Virtualization technology addresses this with two key features. The first feature is the ability to convert a physical server operating environment [actual] to a logical operating environment image [virtual]. This is referred to as a *P-to-V* conversion. The second feature enables an administrator to relocate the virtual operating environment to different hardware for co-location or in the event of disaster recovery. This is referred to as *virtual motion* and can bring a server back online in a matter of minutes instead of the days it may take for a traditional reload after the procurement of replacement hardware.

The technology that drives virtualization is delivered by solutions from VMware®, Citrix® and Microsoft®. These solution providers to the enterprise space have all proven success with their products. While VMware® is the name most commonly associated with virtualization, it is unclear who will emerge as the dominate force with the release of new options in Windows Server® 2008 and Citrix® XenServer™. The benefits of each technology are the subject of much debate among industry experts and IT professionals alike. The choice often comes down to what option best addresses very specific business objectives.