The Power of Virtualization: A Management Series for SMB
Part One: Virtualization Fundamentals

Virtualization is one of the hottest topics in enterprise computing today, with advocates promoting benefits including improved business efficiency, cost savings, and mission-critical data and application protection. This series examines some of the implications of virtualization on small and medium-sized businesses.

Virtualization is a critical discussion topic for IT managers and business executives today. It is a technology solution that addresses a number of business drivers – including cost, speed and quality of service – that affect almost all industries.

Although the terms virtual and virtualization have been applied to a number of technologies, the central principal is simple: virtual, in IT, refers to something that appears to be real and can be treated as real by a person or program, but in fact exists only in software, or in software supported by special-purpose hardware whose presence is transparent to the user.

Each virtual machine contains a complete system, eliminating potential conflicts. VMware virtualization works by inserting a thin layer of software directly on the computer hardware or on a host operating system. This contains a virtual machine monitor or ―hypervisor‖ that allocates hardware resources dynamically and transparently.

Multiple operating systems run concurrently on a single physical computer and share hardware resources with each other. By encapsulating an entire machine, including CPU, memory, operating system, and network devices, a virtual machine is

é the cost of hardware vs. the costs of energy, staff, and real estate now make it an economic imperative to virtualize.

In general, virtualization lets you run multiple virtual machines on a single physical machine, sharing the resources of that single computer across multiple environments. Different virtual machines can run different operating systems and multiple applications on the same physical computer.

Software such as VMware vSphere and VMware ESXi (a free download) transform or ―virtualize‖ the hardware resources of an x86-based computer—including the CPU, RAM, hard disk and network controller—to create a fully functional virtual machine that can run its own operating system and applications just like a ―real‖ computer.

completely compatible with all standard x86 operating systems, applications, and device drivers. You can safely run several operating systems and applications at the same time on a single computer, with each having access to the resources it needs, when it needs them.

This is similar in nature to the use of higher level programming languages, which hide the underlying architecture from the programmer, or database query languages that hide implementation details from users.