

# Expert Insights

ANALYSIS &amp; ADVICE

 N° 20

## Virtualization: a strategic decision

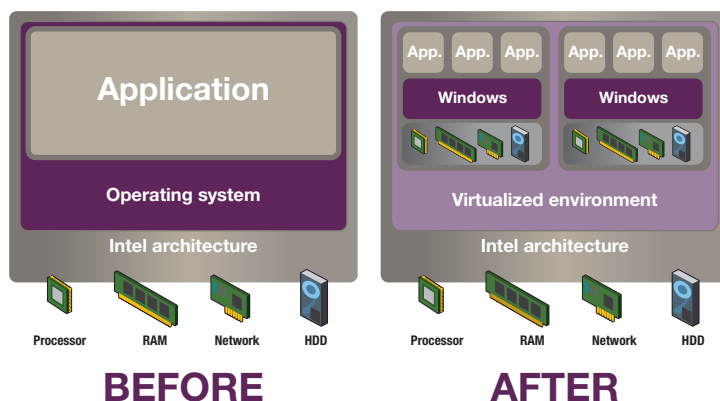
*Virtualization technologies offer infinite possibilities in terms of infrastructure redeployment and consolidation, which can assist companies in optimizing IT methods and architectures. Combined with the advantages of an operating lease, virtualization can be used to implement on-demand IT with the flexibility to handle unplanned changes in workloads.*

**N**etworks, storage, servers: virtualization now applies to all the key components of the hardware infrastructure. If the hardware and software manufacturers who are actively pushing such solutions are to be believed, virtualization promises to cut costs by making more efficient use of the company's existing resources. This

involves splitting up a single physical resource into logical partitions which will be recognized by the operating system or applications as separate dedicated resources. The technology can be used to segment and secure local or remote networks (VLAN), to share storage resources in VSANs and consolidate servers.

### THE ADVANTAGES OF VIRTUALIZATION

*The virtualization solution is installed on the initial architecture and can be used to run several operating systems and applications on virtual machines that share the same physical resources.*



*Each virtual machine represents a complete system: processor, RAM, network connection, storage resources and BIOS*

SOURCE: VMWARE

### The on-demand trend

By using the existing resources to their full capacity, virtualization therefore reduces the need for expanding the IT asset base. A number of applications, after all, do not use 100% of the resources allocated to them at the same time. In addition to streamlining and consolidating infrastructures, virtualization technology can also be used to implement cost-effective disaster recovery plans without necessarily requiring physical backup machines, and for conducting quality control tests more quickly and economically, even for platforms which have not yet been physically rolled out. In many ways, virtualization technologies are a materialization of the strategic concept of on-demand IT: the company only pays for the resources it actually uses. But such a strategy depends on more than just technology.



## The strategic dimension

When planning a virtualization solution, it is important to consider the IT infrastructure and how it is going to evolve in the future. A common mistake is to focus exclusively on the technological potential of virtualization while overlooking its strategic dimension. Any virtualization project should be implemented as part of a clearly defined strategy and for a specific purpose; for example, reducing heterogeneity among physical servers or redeploying all or part of the infrastructure after a major change in the company organization, or providing the resources to cope with any future increases in workloads without exceeding the budget. In any event, use of virtualization technology is – or should be – the result of a strategic rethinking of the IT architecture and its application requirements.

## Virtualization = separation

For each application, it is necessary to establish precisely what needs the various virtualization technologies (servers, storage or network) can meet and to remember that virtualization consists essentially in separating elements of the IT system. In a non-virtualized system, there is an obvious, natural link between the application and its resources: between the server and OS on the one hand, and the storage disks and the network connection on the other. These are usually part of the actual configuration of the application, making it easier for the application and the infrastructure to communicate. But in a virtual envi-

ronment, this intuitive understanding between hardware and software no longer exists: the hardware layer – i.e. the physical server, storage array or network – becomes “invisible” to the application. The issues of locating and assessing the optimal size of the IT resources still remain and in turn raise a number of other concerns: to use 100% of the physical resources, it is not only the link between the application and its environment (storage, server, network) that needs to be reviewed but also the procedures for managing IT resources, anticipating increases in workloads and monitoring performances, etc.

## A detailed profile of the production application

On the bright side, virtualization offers a unique opportunity for improving the readability of the application architecture, by changing the implicit dependence between an application and its resources into an explicit, documented link. A virtual system requires a better understanding of the behaviour of the application with which it will be used. Identifying a virtualization opportunity and assessing its suitability for the application architecture in question requires establishing a detailed profile of the application under production conditions. This profile would identify such factors as the average use of CPU and RAM and the frequency and length of increases in workloads, utilization of storage resources and the need for increasing these resources in the future, the rate of use of the network during normal and peak workload hours, and so on and so forth. With multi-tier applications, the same operation can be repeated for all the components involved. A detailed analysis of the way the application works in its environment can reduce, if not eliminate altogether – the “black box” effect often caused by the implicit link between the application and its infrastructure.

## Analysing utilization rates

It is therefore vital to analyse the behaviour of an application before implementing virtualization technology: such analyses can enable a company's IT department to determine which applications make appropriate use of the infrastructure resources at their disposal. When compared

## POINT OF VIEW

### Don't overlook licence management

From a technical point of view, creating a new virtual Windows 2003 server from an existing virtual server is actually no more complicated than duplicating a file. It is this very technical simplicity that tends to lead companies to overlook the crucial question of software licence management. On the whole, in terms of price, there is no difference between installing operating systems and applications on physical server or virtual ones. However, the types of licence on offer from software manufacturers still carry a number of considerable restrictions in terms of virtualization features. Take

VMware's VMotion, which enables the live migration of running virtual machines from one physical server to another: in a Microsoft environment, migration is possible if the physical source and target servers both have the relevant licences. It becomes more complicated, however, to move licences from one physical server to another: the company will only be able to do this once every ninety days, or in the event of a hardware failure; otherwise it will have to purchase the missing licences. In such cases, leasing has the added advantage of covering software licences.



**Did you know?**

**12%:** the average rate of use of the processor on a server dedicated to an application. (source: ECS, interview notes)

**90%:** of VMware virtualization platforms have gone into production, mainly for consolidation strategies. (source VMware, Microsoft)

According to a survey by IDC, the virtualization market will be worth

**11.7 billion dollars** by 2011.



with the actual value-add contribution of the application to the company's business, an exhaustive analysis of the use of infrastructure resources can give an accurate assessment of its overall profitability and thus enable companies to plan future investments more effectively. With detailed, structured documentation, it can therefore be possible to allocate – along the same lines as cost accounting – use of infrastructure resources to the various IT applications. This approach will also enable IT departments to determine under what circumstances virtualization can be of the most use. A thorough knowledge of application behaviour can therefore give a glimpse of the “bigger picture” of virtualization, i.e. to see it as a tool that can be used as part of a long-term optimization strategy.

### Different strategies and use

As a technological solution, virtualization can contribute to a number of strategies for optimizing both the systems themselves and the procedures and methods for managing them. In addition to the consolidation capabilities so widely touted by hardware and software manufacturers, virtualization can also be used to improve fault-tolerance in sensitive applications, or to speed up and simplify change management. In a way, it is the application itself that determines –

depending on its behaviour, criticality, and the complexity of implementing it – the mode of virtualization best suited to it.

### Combined with leasing

As a strategic tool, virtualization can be incorporated into an overall asset management strategy – as can IT asset leasing. Both virtualization and leasing can give companies the flexibility to react quickly and efficiently to the unexpected, without affecting their ability to invest in their core business. Leasing is ideal for financing virtualization strategies, and, by extension, implementing broader strategies for consolidating and streamlining infrastructures. ECS' online asset management tools ensure accurate, up-to-date information on the servers, their upgrade possibilities and technology trends on the market. ECS' experts can then use this knowledge to assist companies in assessing the feasibility of using virtualization technologies, determining which components of the infrastructure they should be applied to, and prioritizing. Companies can also rely on the financial engineering of ECS' leasing solutions to manage both hardware and software assets (licences). They can thus roll out virtualization strategies as and when they familiarize themselves with the new IT management procedures.