

Hidden Costs of Virtualization



Introduction

Virtualization has moved into the enterprise mainstream. Until recently, virtualization solutions tended only to be used to consolidate data center servers. However, that has changed and, today, virtualization is recognized as a technology that can provide substantial benefits to businesses of all sizes in all sectors of industry.

What is virtualization? In simple terms, it is a technology that allows a single computer to act as multiple computers. In a virtualized environment, multiple virtual machines, each with its own set of virtual hardware, can run heterogeneous operating systems in complete isolation from each other on the same physical computer.

This enables a business to do more with less. The workloads from underutilized servers can be consolidated to a fewer number of servers that results in increased utilization ratios and decreased total cost of ownership (TCO). Additionally, the removal of physical servers from the infrastructure results in decreased management, rack space, energy and heating, ventilation and air conditioning (HVAC) costs.

The savings can be considerable. VMware's TCO Calculator¹ is an online tool that provides a report contrasting the TCO of your current environment with the predicted TCO of your virtualized environment. Try it. You'll probably be surprised by the extent of the savings which could result from virtualization.

Virtualization can provide a business with real and substantial benefits, but it is not without costs. While many of the costs are obvious, such as the purchase price of the necessary hardware and software, others are not so obvious. In order for a virtualization project to deliver both the expected results and the expected return on investment (ROI), a business must understand not only the technical challenges, but also have a thorough understanding of the costs involved and the factors that can result in those costs rapidly increasing.

What's driving virtualization into the enterprise mainstream

Much of today's interest in virtualization is driven by the desire to consolidate servers to reduce sprawl, but many businesses are also looking to virtualization to provide a range of other benefits, including:

- Simplified management
- Reduced downtime
- Enhanced security
- Reduced networking and cabling costs
- Reduced server TCO
- Legacy environment re-hosting
- Reduced energy costs and a reduced carbon footprint

Virtualization can enable a business to meet each of these objectives, and some others too. But, as already stated, it is not without its financial impact; to derive maximum business value from a virtualization initiative, a business must ensure that each of those potential costs are established, assessed and factored into the ROI calculations.

Hidden costs

Adopting a virtualization infrastructure requires money. Servers might need to be purchased. Software and support contracts will need to be purchased. The IT department will need to put in additional hours in order to provision those servers. While these expenses are all obvious, there are some that are less obvious. And in some areas, such as energy costs and HVAC, virtualization results in some additional expenses that must be offset in order to determine the net savings potential.

Energy and HVAC According to San Francisco-based utility company Pacific Gas & Electric, energy and HVAC costs for running a server amount to somewhere between \$300 and \$600 per year². So, by removing a server from your infrastructure you'd save between \$300 and \$600 per year, right? Not necessarily. A server that hosts multiple virtual servers uses more energy and produces more heat than a non-virtualized server.

While virtualization will certainly result in a net reduction in energy and HVAC expenses, it would be incorrect to assume that that reduction can be calculated simply by referencing the number of physical servers that are to be decommissioned. How much will it actually cost you to run a virtualized server? That will depend entirely on the model of the server on the number of virtual servers it will host.

To work out the specifics, you need to consult the manufacturer's documentation. Management Virtualization can certainly simplify management, but it can also introduce additional complexities. While the benefits of a consolidated and reduced physical server base are obvious, not so obvious are some of the difficulties that virtualization can bring to everyday management functions.

- **Licensing** — Licenses restrict the number of occasions on which an application can be installed. While certain licenses make exceptions for virtual installations, others do not. In a virtual environment where images of operating systems and applications can be easily and speedily deployed, ensuring license compliance can become an arduous and time consuming process.
- **Maintenance** — Finding a time slot to patch and reboot a non-virtualized server isn't usually too problematic. Finding a time slot to patch and reboot a server that is hosting several virtual servers can be much more difficult. And at the enterprise level, where there might be hundreds of physical servers each running multiple heterogeneous operating systems, establishing a maintenance schedule can be horrendously complicated job that requires extensive planning.
- **Security** — While a virtualized infrastructure can be inherently more secure than a nonvirtualized infrastructure, virtualization nonetheless results in security becoming a more complicated matter. Not only must administrators ensure that physical systems are secure, they must also ensure that virtual systems are secure. The additional tier that virtualization introduces to an infrastructure can make managing security a more difficult and time consuming process.

Training and retraining Virtualization and business rationalization often to go hand-in-hand. A business adopting virtualization has the opportunity to consolidate more than just its physical servers; its people and its processes can be consolidated too. While restructuring and rationalization can result in improved operational efficiency, it can also result in staff being moved into areas where they lack familiarity and require retraining.

Staff also needs to be able to deploy, manage, secure and troubleshoot within the virtual environment. Specialist knowledge is required and so, depending on the level of expertise that already exists within a business, product training may be a necessity. Each virtualization vendor offers a number of training packages but, of course, it costs time and money to have staff attend. Virtual servers sprawl One of the main benefits of virtualization is the ability to create virtual servers quickly and easily, but this can also lead to problems.

The fact that it costs next to nothing to provision a new virtual server has resulted in some businesses failing to exercise any form of real control over the process.

The result? Virtual server sprawl. Each virtual server requires space on its physical host and requires much of the same management work as a physical server (patching, permissions, etc.). To allow the unchecked and unnecessary creation of virtual servers will result in invariably additional costs, eroding the savings which were achieved through the elimination of physical server sprawl.

In order to prevent sprawl and avoid unnecessary costs, virtual server “acquisition” should be subject to similar rules to physical server acquisition. Backup and Migration Backup can become more of a challenge in a virtualized environment. Determining what needs to be backed up, how often it needs to be backed up and establishing the necessary windows in which to schedule backups without resource contention can all prove difficult. Does the entire server need to be backed up or only the individual virtual machines? The former is more simplistic but less reliable and results in extremely large backup.

The latter is more reliable and results in smaller backups, but could be difficult to schedule (parallel backups of virtual machines running on the same physical host will cause resource contention and even a nonparallel backup might limit the resources available to other applications on the host).

Transportability is another area of difficulty. A backup of a virtual server cannot easily be restored to a physical environment, and vice versa. This can result in a limited range of recovery options. Specialized tools, such as Acronis True Image Enterprise Server with Universal Restore can overcome the challenge of migrating from a virtual to a physical environment, but few companies offer such capabilities. It is critical that if you plan to employ a virtualization strategy, you have a method of backing out, should that become necessary for a given virtual server.

After all, some applications that run fine when first deployed could become resource hogs later on and require migration back to a physical server. The problems are far from insurmountable, but backup strategies must be carefully planned in order to ensure that reliable backups while avoiding resource contention.

Summary

Despite the hidden costs described in this paper, virtualization has the potential to provide a business with real and substantial benefits. However, in order for those benefits to be maximized and for the virtualization project to deliver the maximum ROI, it is essential that the project be thoroughly planned and all possible costs and complications factored into the budget and roadmap.

About Acronis

Acronis Inc. is a technological leader in storage management software, and provides a range of server and desktop protection and recovery solutions which minimize downtime and enable businesses to get back to business as quickly as possible. Acronis True Image enables backups to be created and restored in a matter of minutes. Backups can be restored to bare metal or dissimilar hardware and a wide range of 32- and 64-bit operating systems are supported.

Additionally, Acronis True Image provides a solution to many of the problems associated with backup in a virtual environment. Both products support physical-to-virtual (P2V), virtual-to-virtual (V2V), virtual-to-physical (V2P) and physical-to-physical (P2P) migrations providing IT professionals with the widest possible range of backup and recovery options. Furthermore, the products run both within the host operating systems and within each virtual server in order to help ensure that all necessary files are backed up. Acronis True Image supports SAN, NAS, DAS, RAID, USB, CD and DVD enabling existing storage devices to be fully leveraged. Additionally, backups are compressed to help maximize the use of existing capacity. Systems can be backed up online providing 24/7/365 availability for mission critical systems.



For additional information please visit <http://www.acronis.eu> or e-mail sales_eu@acronis.com

UK, Northern Europe and MEA:

Acronis Ltd.
Tel.: +44 203 1760340

Central and Eastern Europe:

Acronis Germany GmbH
Tel.: +49 89 6137284-0

Southern Europe:

Acronis SAS
Tel.: +33 1 42815531