



Advance of a key technology

Virtualization: Much ado about a lot of benefits

There is no need to discuss the advantages of virtualization any more. Data centers, servers, memory capacity, desktops and applications can be better utilized and maintained with it, making for bottom line cost savings as well as increased efficiency that ultimately will even benefit the environment. But the technology has by no means exhausted its potential. For instance, according to current figures from the Experton Group, only two percent of all servers in Germany are virtualized. Specialized service providers such as Siemens IT Solutions and Services can help to change this and are leading the way in their own company group by good example.

It has only been since this year that most companies have given priority to making IT resources more flexible through virtualization. It is no coincidence that ultimately everyone is currently looking for options to operate more efficiently, lower running costs and to be able to respond more quickly to new challenges. The beauty of a virtualized IT infrastructure is that companies of any size can profit from it: Large groups record significant energy savings and optimized processes while small to medium-sized companies on the other hand gain availability the like of which they could only dream of previously.

Andreas Vogl, Product Manager Transformational Data Center at Siemens IT Solutions and Services knows that "Virtualization of servers still continues to have top priority". "Accordingly, in many companies this technology is gradually and increasingly becoming accepted as the basis of modern data center operation. It is also in this area that the most solutions and offers are available". However it is often a long route from the wish itself to its practical implementation, as the market researchers of the Experton Group have found out: Out of the 3.26 million servers in this country only just 65,000 are virtualized. This means on the same hardware - the server - several operating systems are running in parallel, for instance Windows and Linux, so that the one real server can be used jointly by several virtual servers. Luckily more than half of the companies interviewed have already collected data on their initial experiences on this subject and a further 16 percent plan to do so in the near future.

Virtualization – more easily said than done

"The majority of virtualization projects are complex and challenging and therefore most companies need external support. The most important component for success is an integrated architecture of all processes and tools because it is only in this way that complete automation can be achieved" according to Vogl. "Siemens IT Solutions and Services is well equipped to do this. We have been collaborating for years with leading manufacturers of virtualization solutions, for example VMWare or Microsoft."

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As with all other IT projects, success also always depends on the customers' actual situation and the existing IT landscapes. "If there is already a highly automated environment there, then any further potential can quickly be enhanced by means of virtualization. In the case of badly managed data centers this is of course not easy and much preliminary work has to be done. This is worth it however because our experience shows that with the help of virtualization approximately 40 to 60 percent of costs can be saved", says the data center expert, summarizing the situation. "And it is precisely these figures which ultimately convince companies, who hotly debate this topic. For many years now Siemens has been using virtualized applications and environments in its own group. This is the best proof for our customers that we are also successfully utilizing the product we are selling."

That this topic is up and coming can be seen in the results of a Gartner study: Overall the sales of virtualization software in Europe, the Middle East and Africa (EMEA) for year 2009 are set to rise by 55 percent to a total of 512 million Euros. Experts see the largest part in the management solutions' business therefore for the first time exceeding sales in the infrastructure software sector. Top of the growth list will be the virtual desktop software with a positive potential of an estimated 335 percent - however with a turnover of a good 52 million Euros this makes it by far the smallest market segment. The market researchers of IDC make similarly positive prediction on the subject of virtualized data centers. According to them, by 2010 every fourth server will be a blade system – a future-oriented alternative to the rack and tower servers still mostly predominant to date.

After the servers come the desktops...

If you go one step further from the topic of server virtualization, it soon becomes apparent that individual users can also profit from this technology – in the area of desktop and application virtualization. The aims are the same as for the servers, namely to reduce the costs for hard and software and the expenditure for operation and maintenance. Likewise a working environment can be created in which employees and customers and partners too can have access to all data and applications at any time. This happens irrespective of the particular terminal whether laptop, Smartphone, Mac, iBook, PC or Thin Client.

"Most of the costs are incurred by desktop management, especially when testing applications. Do all the applications really run on one operating system and do they negatively influence each other? How high is the conversion expenditure for migrating my XP-based application landscape to Vista or Windows 7? If the individual applications are virtualized then these constraints and dependencies disappear. They are then running in a stable environment and are no longer dependent on the client's operating system," comments Vogl with respect to these challenges.

The reasons for the increasing demand for desktop virtualization are therefore clear. But what does such a project look like in practice? The expert describes this as follows: "Today users have different images on their physical notebook or PC, for instance for XP or Vista. One possibility is that the images remain on the fat client, i.e. on the physical

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hardware. The other option would be to host and operate them on a data center server – to use quasi streaming. Users then utilize the data center power and work only with the help of a front end via which they can access their centrally stored data." The advantage of this method: Clients can be centrally managed easily and cost-effectively. Consequently rollout and transformation costs drop. Furthermore operators of the solutions can use synergy effects because the automation processes used can be utilized both for server virtualization in the data center and for client and desktop virtualization.

At the same time it must be remembered that virtualization of desktops can be highly complex. Companies have clearly more clients than servers in operation and most of these are also at different locations. "In the case of desktop virtualization it is also important to differentiate between the three levels involved - processes, applications and access, and to combine them in the best possible way. In most cases solutions from different providers are used for this," says the Siemens expert, commenting on the problem.

... and after the desktops comes storage

The topic of storage virtualization is now also emerging from the shadow of its big brother - server virtualization. "Here the technology is driven for the most part by the manufacturers of storage systems, who from the very start integrate their virtualization solutions into their products," explains Vogl. The steady growth in data volumes and the need to manage the space it occupies show that this is the right approach and not just an arbitrary business development. "Here hardware manufacturers and the providers of virtualization solutions are equally challenged to find answers to avoid reduplication i.e. the double storage of data or to be able to Storage virtualization provide thin provisioning," Vogl explains. works like this: A virtualized level is added between the hosts and storage. This means that the hosts now only see logical or so-called virtual volumes, which in turn are created from physical volumes. The advantages are obvious: Better storage utilization, simplified administration and increased reliability.

According to a study by Techconsult (2008) the topic of storage efficiency has a lot to offer German companies. 60 percent of the 200 companies interviewed stated that their storage systems were on average only half-full over the course of a year. 15 percent reported utilization to only a quarter of capacity. Correctly estimating storage requirements was still very difficult for most companies according to the results of the survey. It is therefore not surprising that not even ten percent of all those interviewed are working with virtualization. Those that are were usually only including 50 to 75 percent of their total data volume in their considerations.

"Many companies don't have the know-how and staff needed within the company," says Vogl, explaining the problem. "What's more - in small and medium-sized companies storage architectures have to be converted first of all into complete networked IT infrastructures, i.e. extensive harmonization and consolidation projects are needed. Only then can those responsible devote themselves to the topic of storage virtualization."

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Another crucial matter: Even if according to the data from Experton analysts the price of hardware is reduced by an average of around 30 percent a year, storage and maintenance expenditure continues to rise. Strict safety and compliance guidelines do the rest. The topic is even more difficult if mergers and acquisitions are imminent - the end effect is therefore that new IT landscapes are added to the existing and the whole infrastructure becomes heterogeneous as a result. In such cases, enterprises need to make even greater efforts to combine their different solutions under one management interface. The virtualization expert's opinion: "Generally, the more systems there are, whether physical or virtual, the more important and complex their management becomes."

Everything is difficult to begin with - but it's worth it

The greatest challenge with virtualization projects, as with all other projects, is the first step. Which topic should the company start with: Storage, server, clients or applications? What needs to be considered so that IT resources actually run more cost-effectively, flexibly, efficiently and with greater productivity? Siemens IT Solutions is able to manage such complexity because of its long years of practical experience. Initially, consultancy and analysis services are important: Where in the company can virtualization be best utilized taking account of its business targets? What route should be taken and which virtualization architecture is suitable to achieve this target? Which controls have to be defined and what measures taken? Once all the outstanding points are clarified, Siemens IT Solutions and Services takes the next step and if desired can also put them into operation - the best possible solution for the customer at the end of the day, Vogl believes.

"We can't identify any individual industry that implements virtualization particularly comprehensively or particularly inadequately. The topic always depends on the applications used. In a bank, for instance, an application that is responsible for financial transactions must always be highly available. So that it also runs with stability in virtual environments the necessary level of reliability is set to be considerably higher than for an application that can break down even for half a day without any particular consequences. These requirements have in the meantime been recognized by providers and realized in practical terms in initial projects. This in turn has the consequence that branches of industry such as the public sector, for which previously there was no suitable solution, are now following suit", says Vogl, outlining the situation.

New models are arriving safely

That IT experts have been at home for a long time now in the world of virtualization is being demonstrated also by a solution for a large Internet and telecommunications provider: The so-called "common computing platform", that has been developed specially for this customer. "It offers a flexible infrastructure with which the customer can quickly gain virtual access to on-demand services. Payment is made according to the

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agreed charging times," Vogl explains. "This principle and the method of procedure can naturally be adapted and applied to the individual requirements of every other customer."

Service development at Siemens IT Solutions and Services is also given high priority. "We are active in the user-owned-device area. This means in concrete terms that employees use their own hardware for their work. Virtualization allows the corporate image and the necessary company data to be deployed on it. Data back-up and protection are also virtual. The attraction for employees is financial. In the USA or Asia these models are already arousing a lot of interest," Vogl reports. The advantages for companies are obvious: They save purchasing and maintenance costs and employees work with devices that are familiar to them.

Getting it right when it comes to environmental protection

The long-time trends of green IT and CO2 reduction are driving forward the development and distribution of virtualization technologies. It is known that data centers count among the largest consumers of energy worldwide, not to mention the CO2 emissions from IT in general. At the present time, work is being carried out worldwide on rules and programs intended to put an end to this wasteful state of affairs. For example the European Union is working in collaboration with manufacturers on obligatory targets to increase energy efficiency. And because the energy saved can be directly calculated into CO2 reduction, there are more than enough incentives for a commitment from manufacturers.

"Of course it must be remembered that climate control technology is an important factor in the entire virtualization scene," the Siemens expert believes. "In addition to our offer of various virtualization technologies, we also offer energy management and automation, together with other Siemens Sectors. This means customers receive a whole package from one source and a provider who not only has state of the art IT technology, but who can also install a new climate control unit in the data center at the same time." Why this integrated approach is so important becomes clear from the following figures: Energy costs alone from virtualization solutions pay for themselves on average after a maximum of two years. A new climate control unit however takes five to seven years for a Return on Investment (ROI).

But that's not all: The experts are not only reducing 20 physical servers to one virtual server but are also striving to make the topic of virtualization into a concrete part of the company strategy. The importance of consultancy and monitoring from specialized and experienced providers becomes clearly apparent when the possible stumbling blocks are taken into account – whether these be financing costs, disaster recovery or backups.

Virtualization across the board

"In the next three to five years there will be no data centers in existence without virtualization. Virtualization will then be the standard. Of course the characteristics and the grades of solutions introduced will differ. But judging from customer enquiries and projects, resistance is steadily decreasing. In the case of applications being introduced

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today, for example, care is being taken to ensure that they run smoothly in virtualized environments,” says Vogl, taking a look into the immediate future.

Start boxes

Virtualization Services along the complete value added chain

Server: Virtual managed server, the customer can order virtual server systems and then use, manage and transfer his own applications himself.

Applications: Web applications or other applications are managed in virtual environments.

Desktops: PC and desktop virtualization with defined roles.

Storage: Managed storage, cost-effectively and efficiently classified into availability classes.

Air Conditioning: tailor-made concepts and systems for every type of building from Siemens Building Technologies, from individual solutions to general contractor role

Start boxes

Golden rules for introducing virtualization solutions

Set the course:

- Specify the aim – define the virtualization vision for the company.
- Implement ongoing success reports – ROI calculation from the very first project.
- Define virtualization as a platform - Identification of current and planned application development projects.

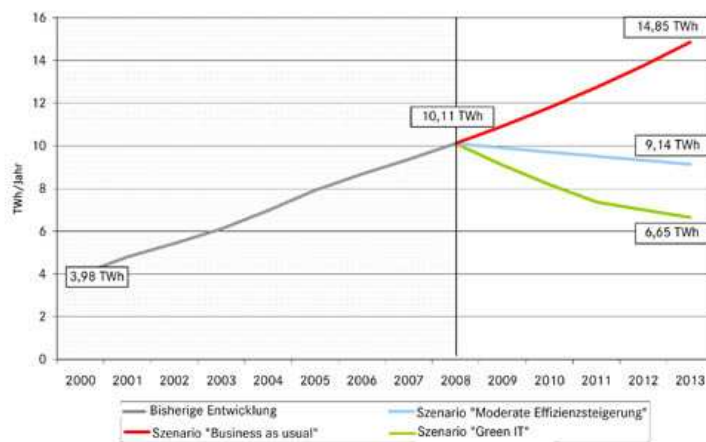
Stay on course:

- Keep an overall view – Introduction of a Configuration Management Database (CMDB) and monitoring of servers’ efficiency.
- Keep performance in mind – measure response times from applications and ongoing capacity planning.
- Turns administrators into “architects” – definition and conversion of integrated automation of workflows.
- Decommission any unnecessary hardware.

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Caption: Andreas Vogl. (Source: Siemens IT Solutions and Services)

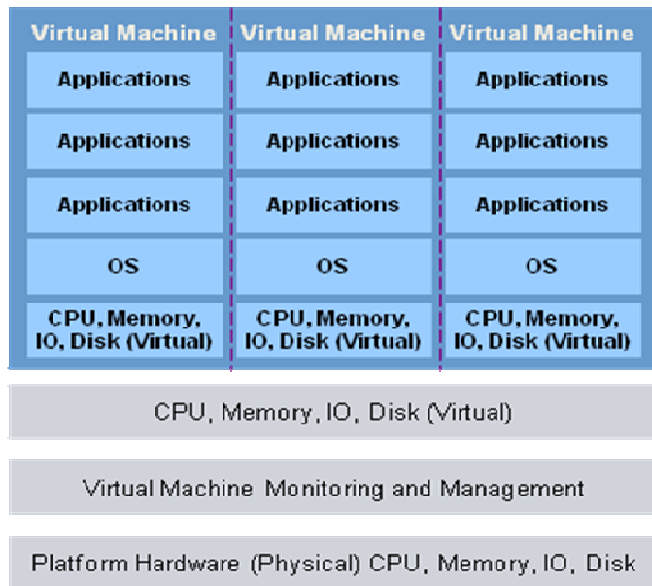


Caption: Anticipated energy consumption of data centers in Germany from 2008 to 2013 (Source: Borderstep 2008)

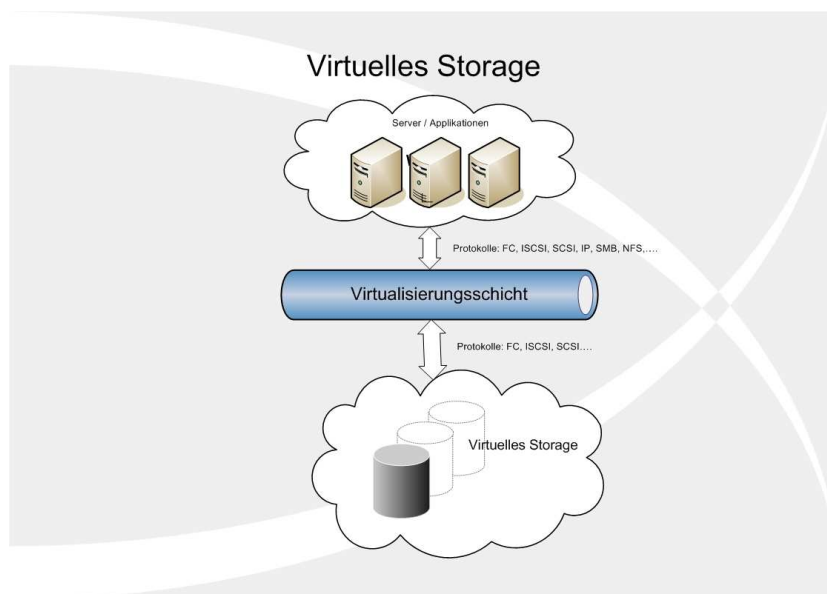


Caption: Siemens IT Solutions and Services will implement green and sustainable modernization on around 25,000 servers throughout Germany in the coming years. In a few data centers, such as Fürth or Munich, blade servers are already operating together with an energy-saving cooling system. (Source: Siemens)

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Caption: A virtualization project is usually complex and challenging. In light of the numerous components that have to be taken into account, an integrated architecture of all processes and tools is therefore the most important component for success – i.e. complete automation. (Source: Siemens)



Caption: The virtualized level between hosts and storage leads to better storage utilization, simplified administration and increased reliability. (Source: Siemens)