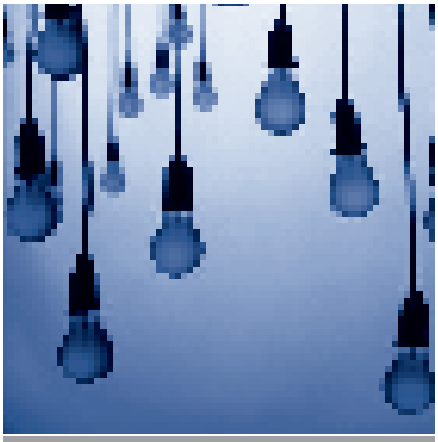
Virtualization Releases Energy

VMware® Software Yields 25:1 Server Consolidation Ratio and High Availability



KEY HIGHLIGHTS

INDUSTRY: **ENERGY**

RESULTS

- High level of availability
- Increased error tolerance and rapid disaster recovery
- Achieved 25:1 consolidation ratio
- Lowered costs in multiple areas: hardware, management, electrical power and air conditioning systems
- Increased server utilization from 15 percent to 75 percent
- Centralized server management
- VMware P2V Assistant simplified migration of physical servers to virtual machines
- Increased flexibility: Set up new services within minutes without needing new hardware (previously it took five weeks)
- Hardware maintenance without downtime

"The need to save space was the immediate reason for our migration into a virtual infrastructure. In addition to a consolidation ratio of 25:1, we also somewhat incidentally acquired an elegant high-availability solution. The cost factor is the 'dot on the i' of the entire project."

Jürgen Kehl, Director of the Computer Center, Energie AG Oberösterreich

Physical Move Turns On Virtual Infrastructure Project

Energie AG Oberösterreich is a leading European infrastructure corporation with both business entities and subsidiaries in the electrical power, water and waste management arenas. The company, located in Linz, Germany, provides its services to Austria, Southern Germany, the Czech Republic, Hungary and Slovakia.

It was not purely the joy of innovation that led Jürgen Kehl, director of the computer center of Energie AG, to construct a virtual infrastructure in 2004. The real reason was a physical move—the old building that housed Energie AG Oberösterreich was to be torn down. Before moving into the new company location, the company would have to move into temporary quarters. Unfortunately, these quarters gave Kehl even less room for his computer systems than the computer center at the company's previous location. In addition, the move was to happen quickly. That's why he and the IT service provider S&T (then Computacenter) evaluated possible alternatives to simply transporting the physical computers from one location to another. Costs also played a significant role in the evaluation.

As a result, Energie AG put together a detailed cost comparison and it was soon agreed that the majority of the present physical server landscape would be migrated to VMware virtual infrastructure. "One of the options we also considered was virtualization with the aid of Microsoft Virtual Server," Kehl recalls. "Upon closer inspection, however, we saw that Microsoft did not meet our requirements at this point in time."

VMware P2V Assistant Helps Keep the Lights On

Energie AG initiated the virtualization project by installing ESX Server on two HP computers. To transfer physical systems into virtual machines on ESX Server, Kehl's team used VMware P2V Assistant, which is a migration tool that converts existing physical systems into virtual machines. VMware P2V Assistant enables rapid and reliable migration from physical to virtual environments by recording a snapshot of an existing physical system and transmitting it to a virtual machine. With this tool, even complex configurations (including applications) can be integrated into a virtual infrastructure. The automatic transfer not only saves a lot of time, but it also offers a high level of transmission reliability. With P2V Assistant Energie AG was able to transmit the images of the old system to the virtual infrastructure over a LAN. "The VMware solutions were conceived for use in companies," explains Kehl. "This shows not only in the stability and performance of the ESX Servers, but it is also seen in smart tools such as P2V Assistant. With it, even the change to a virtual infrastructure can be virtualized. The time savings are enormous."

Powerful, Highly Available and Flexible

The people responsible for the project recognized that virtual infrastructure would bring benefits beyond server migration and consolidation. Early on, Kehl and his team together with S&T created detailed plans for a complete virtual infrastructure with an integrated SAN, offering high availability and rapid disaster recovery. Energie AG currently has four HP ProLiant servers with eight Intel processors, each running ESX Server, with two of the physical computers at two separate locations. All systems are linked via an EMC Symmetrix SAN. The continuous swapping of data into the storage system increases error tolerance and secures the high availability of the services. Using load balancing, computer capacity is evenly distributed over the physical system during normal operations. VMware Virtual SMP also ensures that several physical processors are available for virtual machines as needed.

During hardware maintenance or in the event of hardware failure, the virtual machines can be moved without delay from the affected hardware to other physical machines. Thanks to the use of VMware VirtualCenter with VMotion Technology, this is possible without the user noticing the switchover of the virtual machines even while operations are running. "We presently have 73 virtual machines operating on four physical computers, primarily for the production systems that are absolutely critical to the company, such as the scheduling and call center systems," Kehl explains. "Our experience has shown that with our planned 100 virtual machines, we do not even have to worry about catastrophic events. In an emergency, ESX Server can support 50 virtual machines on each eight-processor physical server."

VMware software offers more than just the apparent advantages of high system availability and rapid disaster recovery. The rewards are enormous even in everyday use. Simply eliminating server hardware saves money. By the time the project is completed, Energie AG Oberösterreich will have saved up to 92 percent on hardware costs alone because it won't need to purchase such high-quality components as LAN and SAN switches. In addition, along with the evident savings in space, Kehl and his team have reduced electrical power costs by about 94 percent even with the planned expansion to 100 virtual machines. "The annual savings in electrical costs alone can pay for the VMware virtual infrastructure for four years," Kehl calculates. "We have moved into temporary quarters for now. Once we move into the new company headquarters, we will use a new air conditioning system there as well. As a result of the consolidation, this new system will be smaller, more economical and save more energy than the present model."

VMWARE ESX SERVER AT WORK

- ESX Server, VirtualCenter, VMotion and Virtual SMP on four HP ProLiant DL740 G2s with 8 Intel processors, each with 3.06 GHz, 4 MB L3 cache and 32 GB RAM
- Guest operating systems include: Microsoft® Windows® NT, 2000, 2003, XP, Novell Netware and Novell/SUSE Linux
- Applications running in virtual machines include: file server, Web server, Oracle, Citrix, SAP, time acquisition applications, GIS, Helpdesk, Call Center and scheduling software
- EMC Symmetrix SAN

Even management will operate more efficiently and cost effectively as a result of the virtual infrastructure. With VMware VirtualCenter, all the virtual machines can be centrally monitored and administered. Having a single point of management offers an overview of the entire system, and new systems become available with a push of the button by "cloning" an existing virtual machine. Instead of waiting the several weeks necessary to purchase and install new hardware, the Energie AG IT team needs only a few minutes to set up a new virtual machine or make an additional service available.

Virtually Unlimited

Kehl sees hardly any limits for the use of virtual machines. "We use VMware software for critical business applications and have had no problems up to now," Kehl says. "Only when we need special hardware or drivers do we use physical hardware. Even system management runs on its own hardware separate from the virtual infrastructure. After we complete this project, we will continue seeking out new ways to virtualize systems. No approach known to me offers more flexibility or cost savings."

Kehl has some final advice for those who are willing to virtualize their systems. "The operation and the expansion of a virtual infrastructure with VMware presents few problems and is even easier to manage than a purely physical infrastructure," Kehl says. "For newcomers, however, precise planning and the conversion of a virtualization project in collaboration with an experienced partner such as S&T is advisable. In our experience, no financial officer will turn his back on the arguments that support the use of a virtual infrastructure."

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