

One ISP feels the power of virtualization



AMD Virtualization™ technology helps Strato AG increase profits and improve their level of service

THE CHALLENGE

- Using 30,000-plus servers in two datacenters to securely host more than three million domains belonging to over one million Strato AG customers
- Finding a virtual server solution that is highly automated and can be managed by only one or two employees
- Guaranteeing customers a high level of service, with supporting deployment and virtualization processes that are transparent

THE SOLUTION

- Deploy virtual servers with a high degree of automation, enabled by virtualization software
- Virtuozzo virtualization software from SWSOFT
- AMD Opteron™ processor-based servers with Direct Connect Architecture

THE IMPACT

- Roughly 30 percent gross profit increase per hardware box, because of the shared resources among users
- Improved customer satisfaction by providing a higher level of service with predictable resources for customers
- Able to manage a large infrastructure of 10,000-plus virtual servers with only two administrators

A move to virtualized servers based on AMD64 technology and Direct Connect Architecture has helped Strato AG to improve the quality of services provided to customers, increase the number of customers per box, and automatically monitor server workloads. In addition, the implementation of virtualized servers has allowed the company to offer a larger product portfolio, fill the gap between shared hosting and dedicated hosting, and dramatically increase their own profits.

Founded in 1997 and headquartered in Berlin, Strato AG is the second-largest Internet Service Provider in Germany. With more than one million customers and platforms hosting more than three million domains, Strato's two datacenters are certainly kept busy — as are the 500 employees who service them. From a technical hotline to general helplines, everyone who works for Strato knows that customer satisfaction is a top priority.

Because of the varying needs of their many customers, Strato offers multiple products — Web hosting, an e-commerce application, and a variety of server solutions.

The ISP industry in Germany has a lot to offer. It's the most mature Web-hosting market in the world, and, as such, there are four big competitors vying for the top spot: 1&1 Internet AG, Strato AG, Hosteurope GmbH, and intergenia AG. Not to mention roughly a dozen smaller ISPs who are trying to break into the top four.

The picture at Strato

When it comes to their server offering, Strato's story has been one of unqualified success. Entering the market in 2003 with dedicated servers and 2006 with virtualized servers, it took them only three years to establish themselves as a major player. Currently, they're hosting more than 30,000 servers, ranging from dedicated to managed, game-specific, and virtual.

Although all Strato servers are currently AMD-based, that hasn't always been the case. They began building their server offering with a mixture of processors in their servers. But the company quickly realized that due to power consumption issues, the switch needed to be made to all AMD Opteron™ processor-based servers. When compared to other brands of processors, the AMD-based servers consumed less power, and more importantly, they were designed with Direct Connect Architecture — ideal for the deployment of virtual servers. "AMD has worked closely with Strato in a very open

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Strato AG

and constructive manner,” said Marco Piattelli, AMD sales director business development EMEA. “Our AMD-based servers combined with their products and services, enable Strato to offer a better, more sophisticated product for the ISP market.”

The virtual server struggle

From its implementation in 2003, Strato's server offering continued to grow, especially in the virtual realm. As one of their largest areas of business, it was becoming a large area of concern as well — for four reasons.

First, an ISP doesn't have any visibility into the applications of its customers. While they have a “big picture” perspective that keeps them abreast of resource utilization, they don't know the details that can affect those resources. According to Julien Ardisson, chief technology officer at Strato, “The server resources are divided among several customers. So you cannot say what the customer will do with their servers. They can host an email system, they can host a DNS, they can host plenty of databases — which take a lot of resources. And, in a simple shared environment, it's very hard to guarantee the quality.” One server may unexpectedly become overloaded, unbalanced, and all customers on that server suffer from the bottleneck.

Second, Strato had become known for and had always cared deeply about offering high-quality and highly responsive services. As such, they needed to find a way to be able to quickly and transparently transfer customers from one server to another when workloads increased, so that bottlenecks would be reduced. But to do that, Strato needed a way to constantly monitor servers for capacity and workload.

Third, they needed a high-density solution. With limited datacenter space and power resources, the more customers they could deploy on servers would leverage their infrastructure assets more fully. With the efficiency of the AMD-based servers, they were able to get more servers in their datacenters, further increasing their flexibility.

Finally, with the ongoing march of technology, Strato customers who were using a dedicated server solution were no longer satisfied with their business being reliant on an “older” machine. According to AMD's Piattelli, “The dedicated server customers want the latest and greatest. If they have machines that are about two years old, either they throw them out or come up with a new concept.” In order to save costs, Strato needed a way to utilize these still-viable machines.

It became clear that to address their four concerns, Strato needed a virtual server offering.

The quest for virtualization, automation, and utilization

Even though Strato would have 10,000-plus virtual servers, they only had one or sometimes two employees to manage them. And the work that comes with a virtualized server can be labor intensive. Often, data has to be moved around for ultimate efficiency. When a server breaks down, all of its virtual servers must be moved to another machine quickly, with no service interruption to customers. As such, they needed a virtualization solution that didn't use too many resources. According to Ardisson, “These kinds of processes must run automatically all day, all week, all year without human intervention.”

The virtualization software also had to do two other things: Provide application program interfaces that triggered the virtualization function, and provide a mechanism to manage the required service levels of the server processor, memory, and disks.

There was yet another factor that seemed obvious, but actually was not. Not all of the virtualization software solutions that Strato considered were ISP-conformed. A virtualization solution designed for the enterprise market won't necessarily be a good fit for the ISP market. But after only three months of testing to find the right solution, Strato found exactly what they were looking for.

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The answer was Virtuozzo

Several of Strato's solution requirements were associated with resource management:

1. Being able to respond to changes in resource requirements and managing resources to provide a consistent, predictable, high level of service. Virtuozzo has a robust set of resource management capabilities that range from resource limitations and guarantees, to allowing users to burst and use unclaimed resources on the server. With Virtuozzo, resources are re-allocatable in near real-time, enabling changes to customer workloads. Customers can also be migrated from one Virtuozzo server to another, with little or no service interruption.
2. Density, from both a resource economy perspective, and because it is the primary factor in the profitability of a service. Virtuozzo offers OS virtualization. It creates virtual instances on top of a single instance of the operating system. The single OS (and potentially applications on the server) enables the most efficient use of every resource on the server from a simple hard drive to the most critical resource on the server — memory. Because there is only a single OS on the server, it is held in memory only once.
3. Not resource intense. Because of the streamlined architecture of Virtuozzo, it is possible to use very average or even dated servers to deploy virtual environments. The efficient memory usage, in addition to effective use of all resources (including CPU and hard drive), enable the most basic of servers to deploy reasonable amounts of virtual environments.
4. Simple to manage. With Strato's limited administrative resources, it was critical to find a solution that had many simple and self-management capabilities. With the single OS, it is incredibly easy to maintain because it is alone on a server to update. With the appropriate templates, the updates for large numbers of virtual environments become simple. With the customer interface tools for managing the server, the Strato virtual services are simple to manage and maintain.

What advantage does Virtuozzo have over the competition? The main difference between Virtuozzo and its competitors is the ability to enable virtualization on the OS kernel level. According to Sören von Varchmin, managing director European/Asian operations at SWsoft, “We do not emulate hardware and hardware drives — we virtualize the operating system. That means that you have one OS system. For example, if you have one Linux system running on one hardware node, you do not need to install the OS again and again in the guest virtual machine. You only need to create the virtual environments.” That means much more performance with much more density, because no additional space is needed for multiple operating systems.

Because this technological advantage lets them use memory efficiently and reduce software duplication, Virtuozzo can offer its customers much higher density than any other virtualization solution. According to von Varchmin, “The biggest advantage of Virtuozzo is the density. Our unique technology allows for much higher densities than any other virtualization solution — by using memory very efficiently and not duplicating software, which provides a much better return on all related assets.”

Virtuozzo also has what is known as “friendly” resource management. Because not all virtual machines are accessed at the same time, there might be a high load on one partition, while others are running at a normal level. With Virtuozzo, resources can be switched from unused partitions to the ones that need the resources at that time.

Strato already utilized AMD Opteron processors for optimal power consumption. These processors could handle diverse workloads, had strong memory management, high bandwidth, and all of the advantages of the onboard memory controller and Direct Connect Architecture. As such, Strato needed a virtualization software solution that would enhance their AMD-based servers and scale over all sockets — a solution like Virtuozzo. With Virtuozzo, Strato could virtualize over all of their current and future processors. In addition, when AMD moves to quad-core, Strato can as well — with the knowledge that

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their virtualization solution can scale to fit, and suit their business needs for years to come.

And lastly, a virtual solution like Virtuozzo not only helps to physically consolidate servers, but to reduce electricity consumption and therefore costs in the datacenter. According to von Varchmin, "In Germany, electricity prices have increased 30–40 percent over the last two years. Using Virtuozzo as a virtualization layer on shared servers compared to implementing additional dedicated servers is helping Strato to conserve energy and reduce TCO."

A win, win, win solution

How has the Strato/AMD Virtualization™/Virtuozzo combination worked out? Just ask Strato. "We have implemented an intelligent quality monitoring mechanism that looks after the resources on each server and puts the workloads that create problems to other servers so the other customers still have the quality we guarantee," Ardisson says.

And getting where they are was relatively simple. Over a period of only three days, they upgraded over 1,000 servers

or hardware boxes, which host the virtual servers. The downtime was short, and according to Ardisson, "has not been an issue."

But that is not all. Strato has found that being able to share resources among customers by having a virtual server offering has given them a higher gross profit per hardware box — roughly 30 percent higher, in fact. And, because they have fewer customers sharing a server, the quality of data their customers rely on is higher, as well.

For Strato, AMD-based servers with Direct Connect Architecture and deploying Virtuozzo not only filled the gap between shared hosting and dedicated hosting, but even offered customers a clearly outlined migration path from a shared server to a virtual server to a dedicated server. Not to mention increasing Strato's overall product portfolio.

And they know it's a solution they can count on now and in the future. According to Ardisson, they can continue to expand the number of virtual servers they manage, and Virtuozzo will still meet their needs. "I think the SWsoft Virtuozzo solution is very well-designed for ISPs. For our company, for what we want to do, the product is perfect."

About AMD

Advanced Micro Devices (NYSE: AMD) is a leading global provider of innovative processing solutions in the computing, graphics, and consumer electronics markets. AMD is dedicated to driving open innovation, choice, and industry growth by delivering superior customer-centric solutions that empower consumers and businesses worldwide. For more information, visit www.amd.com