

Better performance at lower cost



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– Engineer Jens Steinert, IT administrator at the Wildau Technical University data centre.

KEY HIGHLIGHTS

Challenges

- Growing IT demands – increasing need for faculty-specific applications
- Too much time spent managing the physical servers and applications
- High electricity consumption
- Avoiding the need for additional servers and space
- Heterogeneous, partially obsolete server environment
- OS-independent groupware solution with email, contact, calendar and file management capabilities

Solution

Consolidation and server capacity expansion via server virtualisation on new server hardware; automation of server management via VMware management tools, Zimbra groupware solution

Wildau Technical University is well prepared for the increasing demands of the faculties – Aim: virtually 100% virtualisation

New: Zimbra Collaboration Suite

Wildau Technical University, which was established as a TFH (Technical college of higher education) in 1991, is located on the southern outskirts of Berlin. It has just under 4,000 students as well as just under 300 employees, including around 60 professors. The technical college offers 23 courses in three faculties: Business management/IT, engineering/business engineering as well as economics, administration and law. It offers courses at both Bachelor and Master levels. In order to create the best foundation for a successful course and preparation for the job market, the university relies on the support of faculty members and high-quality equipment in the laboratories as well as computer, Internet and library workstations. In order to sustainably maintain the top-class level of studying and teaching conditions, Wildau Technical University was the first German university to have its quality standards evaluated and certified to ISO 9001 in 2009.

Challenges: Heterogeneous IT environment and growing demands from the faculties

The university's data centre provides the backbone of the IT infrastructure for students' courses, employees, administration and application-oriented research. There are also other systems in the faculties and institutes that provide faculty-specific applications. Before virtualisation with VMware, the central data centre had around 60 different types of servers from various manufacturers. The IT environment was therefore extremely heterogeneous in nature.

Like all other university departments, the Wildau Technical University data centre had to consider the tight financial resources common to universities. The IT department therefore had to achieve more with fewer resources. "The aim was to reduce the high electricity consumption, lower air-conditioning costs, avoid the data centre using up additional space and maintain the existing IT staffing levels by streamlining administration," explains Bernd Heimer, Head of the Wildau Technical University data centre.

Virtualisation with VMware has the best management and automation tools

Since autumn 2008, IT decision makers had been discussing whether virtualisation would help to fulfil their requirements. Early in 2009, student employees at the data centre created an inventory of IT structures and services as part of their telematics bachelor course and also analysed the options for achieving the desired objectives. The consistent findings pointed to a recommendation to virtualise most of the IT.

VMWARE VIRTUAL INFRASTRUCTURE AT WORK

VMware used

- VMware vSphere 4.1 with ESX 4.1
- vCenter with
 - VMware HA
 - vMotion
 - Converter
 - Update Manager
- Zimbra E-Mail groupware solution
- Cisco Nexus1000v

IT environment

- 3 Sun/Oracle M6000 Chassis with 15 blades, each with 72 GB memory and 2 Xeon processors each with 4 cores
- Storage from Hitachi with around 400 TByte hard drive capacity

Three solutions were shortlisted: VMware, Xen and Virtualbox. "What we liked about VMware was the comprehensive functionality in vSphere and vCenter: High availability, reliability, vMotion, the Update Manager – the management functions all coordinated and working hand in glove" explains Jens Steinert, IT administrator at the Wildau Technical University data centre.

After the decision was taken in favour of VMware, the project moved on to more specific, detailed implementation planning. This not only involved specialists from VMware but also employees from Cisco Systems, Sun Microsystems and Hitachi, the supplier of the Storage Area Network (SAN). This critical phase of building confidence with a new manufacturer turned out really good for Steinert: "My contact at VMware was easy to deal with; I never felt like I was kept waiting. And he responded quickly and professionally to all of my questions. That's important to me."

The project was implemented at the end of 2009 with the virtualisation of the first servers. "We removed some of the old hardware in order to reduce the heterogeneous nature of the systems," explains Steinert. "Anything big, loud, hot or consuming a lot of electricity was the first out the door." Other servers that were less old were switched to new tasks, others were switched off in order to keep them as backup.

Project experience shows: almost 100% virtualisation is the aim for the future.

The priorities for the software became ever clearer during the project. "Services that need to be highly available were virtualised first because this makes them safer. Virtualisation is unbeatable in this regard," comments Steinert. Basically: "We virtualise everything that we can". This only excludes servers that have software associated with very special hardware requirements and for special management tasks.

Around 50 virtual machines have been set up and around half of the 60 physical servers have now been virtualised. This is an ongoing project that has moved beyond its original objectives. We achieved this in October 2010 with a month's delay because there were delivery problems for the servers' FCoE cards. The fibre channel on-demand technology is a tried and tested means of avoiding I/O bottlenecks, which can occur quickly in virtualised environments.

The FCoE cards are an important requirement for an additional virtualisation step. The administrative PCs at Wildau Technical University are to be converted to virtual desktops. This will be achieved using VMware View. Support for administrative desktops at Wildau Technical University has been incredibly complicated to date. Steinert: "Loading templates produced by the data centre onto desktops, uploading updates centrally and ensuring common release standards – that would all save us a lot of time and effort."

The IT department now has time to handle users' requests once again.

Thanks to virtualisation, the lower human effort required by IT is already visible in Wildau at server level. No jobs were cut in IT, rather the IT department is now able to deal with users' requests again, as Steinert reports: "Previously, some things weren't getting done. We simply couldn't do any more. Thanks to the simple administration of the virtual servers with VMware, we can finally meet users' requirements again. We also have much higher reliability."

Zimbra Collaboration Suite from VMware – ideal in heterogeneous client environments for calendar, contact and file management – independent of the operating system

One important requirement has already been fulfilled: a groupware solution that is independent of any particular operating system. Many users wanted Microsoft Exchange because they were familiar with the comfortable Outlook client. IT was against this because the expansion level of Exchange for all employees and students would have used significantly more hardware resources. In addition, they could not make Windows compulsory because users were increasingly using Apple and Linux clients. The solution should also be provided for all mobile terminals. Finally, the majority of university staff had already chosen the open source client Thunderbird in recent years. It was important to avoid training costs.

After assessing various alternative solutions including Open Xchange, Scalix and Zarafa, the IT department went back to the solution that had already been considered as it now offered a German language interface: Zimbra, an open source solution from VMware. During the project, users were able to vote directly for the features that they would like to have. The group calendar and file storage with user-controlled assignment of access and editing rights were particularly important. For this reason, and as a result of the high access speed even for large accounts, users quickly accepted the Zimbra groupware solution. "Central authentication at Wildau Technical University uses an OpenLDAP server with lower-level Kerberos authentication. When selecting the groupware, it was also essential that it supported this authentication method, which excluded Exchange and Notes for example," explains Bernd Heimer, Head of the Wildau Technical University data centre.

Zimbra also proved to be the most cost-effective solution for the university. The clients of all employees are currently using Zimbra. After more precise analyses of server loads, there are also plans to open the system to all students.

Server administrator Steinert sums up his experience of the VMware and Zimbra project as follows: "We use open-source software wherever possible; this saves us a lot of money. But it is also important to spend money on intelligent software that you can rely on to work without problems every time. That is precisely what we have done and the results are very good."

Future prospects

The next step in the Wildau Technical University virtualisation project is to virtualise the university's administrative desktops. The VMware View solution is expected to be used. IT managers at the university expect to achieve significant savings when it comes to desktop user support.

In the medium term, all 4,000 students will be integrated into the Zimbra collaboration platform. According to the central data centre, the experience with virtualising the server environment creates very good conditions for achieving this objective without the associated expense of electricity costs, additional space and administration effort.

Summary of results

- The IT environment is sustainably prepared for the future increase in demands by the university, in particular with regard to the increase in faculty-specific applications.
- 50% virtualised so far; experience shows that in future everything that can be virtualised will be virtualised, in particular critical applications with the highest availability requirements.
- Cost of IT management reduced significantly via vCenter management tools; the IT team now has time to handle user requests again and drive forward their own innovative developments.
- There is now enough space in the data centre for future increases in demand.
- Lower energy consumption for servers and cooling reduces ongoing costs.
- Zimbra Collaboration Suite
 - requires less server capacity and is independent of both clients and software;
 - provides simple file storage and access control, Web interface, calendar management and contact list comparison;
 - supports the existing OpenLDAP Kerberos authentication and others;
 - provides better speed in the collaboration tool than before.

