UNIVERSITY OF DUISBURG-ESSEN RELIES ON VMWARE'S DESKTOP VIRTUALISATION TO LET STUDENTS AND ACADEMICS PROFIT FROM INCREASED FLEXIBILITY

UNIVERSITÄT DUISBURG ESSEN

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INDUSTRY
EDUCATION SECTOR

LOCATION
DUISBURG AND ESSEN, GERMANY

CHALLENGE
- Optimal utilisation of IT resources
- Meet the demands of students and academics with regard to IT solutions provided
- Reduce administration costs

SOLUTION
Thanks to the desktop virtualisation solution VMware Horizon, students and academics can work – regardless of location, time and terminal device – with a better performing entire IT system and at lower administration costs for the IT team.

BENEFITS
- Better utilisation of IT resources
- Higher performance of the entire IT infrastructure
- Full flexibility and mobility for users
- Lower administration costs

Managing and maintaining out-of-date IT architecture is hard work and time-consuming: it is hardly possible to manage effectively a multitude of terminal devices and operating systems and meet the demands of academics and students at the same time. By introducing VMware Horizon Enterprise and implementing virtualised desktops as well as centralising IT, IT managers responsible for the faculties of Business Administration and Biology and the department of Civil Engineering of the University of Duisburg-Essen (UDE) were able to greatly reduce their administration costs. A further benefit of the virtualisation was that, today, students, academics and staff work much more flexibly. They can access their personal virtual desktop from anywhere at any time. What is more, VMware Horizon Enterprise not only provides Windows and Linux desktop systems, but also offers special systems for the tasks of scientific computing.

The University of Duisburg-Essen was re-established in 2003 as a merger of the Gerhard Mercator University of Duisburg and the University of Essen. With around 45,000 students, it is one of the largest universities in Germany. The internationally orientated range of subjects attracts students from 130 nations to the heart of the Rhine-Ruhr metropolitan region. The University's motto "Open-minded" is the driver not only for its research and education activities, but is also applied to its IT environment. Presently, three faculties have collaborated to implement desktop virtualisation and establish a Competence Cluster for Virtual Systems (CViS). The synergy effects from this are anticipated to broaden the university's knowledge and technology base und contribute to a better use of the given research and education capabilities.

The challenge

The demands on modern university IT are similar across all academic disciplines. The IT teams of the individual faculties are responsible for ensuring that computers and peripheral devices such as printers and scanners are in working order, and that students as well as teachers and academics have access to the necessary computing resources. André Kreft, CIO and Dean of the Department of Biology, said: "With the old-fashioned administration process, it was simply no longer possible to keep the entire IT on the go, especially when having to deal with a multitude of operating systems (Windows, Linux, MacOS, Android) and the important issue of "Bring your own device" at a university with around 45,000 students. We therefore needed a new approach towards providing IT resources. It was time

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CIO AND DEAN OF THE DEPARTMENT OF BIOLOGY
UNIVERSITY OF DUISBURG-ESSEN

VMWARE DEPLOYMENT

- VMware Horizon Enterprise

to streamline IT architecture, make better use of resources, and give students, teachers and academics the flexibility they needed for their work. We were very fortunate that, in the IT service centre of the university's faculty of Business Administration, we already had people with extraordinarily good and long-standing expertise in deploying virtual desktops – here, as many as 400 virtual machines (VMs) have been deployed since 2009 for software-aided teaching. At the same time, collaboration with Dirk Schwarze's team was the core of CViS, to which the department of Civil Engineering has also since belonged".

The solution

With the support of the IT service centre and the use of VMware Horizon, IT managers of the faculty of Biology could achieve their ambitious goal of lowering administration costs and at the same time considerably increase benefits for users.

As a first step, the computer pool for students was virtualised in 2012, and fat clients (or single PCs) were replaced by zero clients. As a result administration costs for the pool decreased by around 60%. Because the VMs can be accessed at home or while travelling, students have since had reliable access to their (academic) data and a multitude of programs from anywhere at any time. Users are provided with a wide range of software for teaching and studying: from simple office applications through to special applications. Desktop virtualisation also allowed to integrate private end devices – such as tablets, notebooks or smartphones – into the IT environment, giving users an ideal degree of flexibility and mobility.

Because of positive experiences with the first step of the modernisation, André Kreft's IT team migrated numerous staff desktops as well as the department's seminar, conference and course rooms to virtual desktops in the subsequent years. Each room was equipped accordingly not only with the necessary hardware, but also with the corresponding virtual solution.

In 2016, the team focused on optimising the VDI environment for scientific computing. The new hardware resources are now designed to provide special applications in a reliable and stable manner via a virtual machine, be it for graphic-intensive image or video analysis, or calculations and display of molecular dynamics findings. Multiple virtual Linux systems are used for this. A particularly interesting use case illustrates CUDA-supported GPU computing with direct access to the K2 graphics cards.

The result

By using the desktop virtualisation solution VMware Horizon, the IT team today can deploy hardware and software resources to all status groups of the faculty of Biology, regardless of location, time and individual technical equipment. With just a few mouse clicks, academics, staff and students have access to all the virtual desktops, applications and online services. This gives them the freedom to organise their work flexibly, use all the programs and work on the operating system of their choice.

The IT environment today runs much more quickly and reliably.

"We are more than happy with the result. With VMware Horizon, we can deploy powerful virtual systems for staff and students as well as computing resources for scientific computing."

ANDRÉ KREFT
CIO AND DEAN OF THE DEPARTMENT OF BIOLOGY
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Furthermore, a powerful server structure enables individual server applications, scientific computing and simulations to be implemented more quickly. Licence management has been streamlined, and the availability of applications, increased.

Thanks to virtualisation, administration costs have been reduced significantly, and data and applications are more secure. Centralising IT has also increased transparency, administrators have more control and the opportunity to customise VMs exactly to fit specific workgroup demands.

A further positive effect is that older hardware, removed during the modernisation process, was converted to zero clients. Students who do not own end devices, or only have a device that is underpowered, can borrow these clients free of charge and use them for their academic work.

"We are more than happy with the result. Thanks to VMware Horizon, we have not only found the right product, but also managed to make our IT system easier and more efficient to use. This has a noticeable effect on performance," says Kreft. "I see the potential for using virtualisation in the Department of Biology's IT infrastructure at around 80%."

The IT teams of the Business Administration and Biology faculties and the Department of Civil Engineering cooperating in the CViS, now also support other faculties and institutions of UDE when they deploy virtual systems.

Looking to the future

The transformation of IT at the faculty of Biology and at CViS has not yet been completed. In regular meetings of the Competence Cluster, which also includes colleagues of the Centre for Information and Media Services (ZIM) of UDE, discussions have been revolving around how the potential of IT can be utilised even better for research and study. For 2017, André Kreft and his team plan to orchestrate the server environment. Kreft goes on to summarise the next steps: "Our goal is to better utilise free resources. We plan to power down the daytime capacity required for virtualising desktops and use off-peak periods for CPU-intensive processes; to achieve this, we will be introducing a kind of queueing system. If sufficient capacity is available, jobs from the queue are computed automatically. This will enhance considerably our effectiveness and intelligent resource use". Additionally we will be expanding GPU computing with remote CUDA (rCUDA) by providing NVIDIA-P100 graphics cards. Furthermore, user-friendliness will be improved by introducing VMware App Volumes and a self-developed self-care portal for personal software management (through to individual software installation by the users). By doing so, the possibility to "Bring your own device" is complemented by the option to "Manage the software on your own VM."

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