University Hospital Essen

As more departments go digital, University Hospital Essen must store ever-increasing volumes of medical data such as radiology scans, pathology slides and surgery videos. With SUSE Enterprise Storage™ running on systems from technology partner Thomas-Krenn, the hospital gained a flexible, super-scalable software-defined storage solution that enables the IT team to provide new services and expand storage capacity faster and more easily than ever before, at 70 to 80 percent lower expenditure than traditional mid-range storage.

Overview

University Hospital Essen is a public teaching hospital that offers comprehensive medical care, and state-of-the art diagnostics and therapies that live up to the highest international standards. Located in Essen, Germany, the hospital serves the wider Ruhr metropolitan area, treating approximately 195,000 outpatients and 53,000 inpatients every year. With many modern clinics and building complexes, nearly three miles of roads, and 54 acres of land, the University Hospital Essen is a large institution that provides essential health services.

Scientific research is tightly interwoven with medical practice at University Hospital

Essen, directly benefiting patients who can be sure of receiving the latest therapies. The hospital is internationally renowned as a specialist center for oncology, cardiovascular medicine and transplants.

With more than 6,000 staff—from physicians, scientists, nurses and physiotherapists, to engineers and chefs—University Hospital Essen is one of the largest employers in the Ruhr region.

Challenge

Collaboration between scientists and medical staff is essential to advance research and healthcare quality. Employees need to be able to share information quickly and easily—as well as securely. Due to the highly sensitive nature of this information, public cloud storage services are out of the question for most organizations in the healthcare industry. University Hospital Essen, therefore, wanted to facilitate data sharing without relying on external cloud service providers.

Beyond information sharing between teams, University Hospital Essen must also store huge volumes of patient data. In recent years, storing the results of diagnostic radiology exams, such as X-rays, ultrasounds and MRI scans, had led to storage costs skyrocketing.

> "It usually takes three months to procure, install and configure a new mid-range storage system. Now, we can simply order a new bespoke system from Thomas-Krenn and add its capacity to the storage pool within days—at 70 to 80 percent lower expenditure."

MICHAEL NIEPORTE
Head of IT Infrastructure
University Hospital Essen

Universitätsklinikum Essen

University Hospital Essen at a Glance:

University Hospital Essen is a leading teaching hospital and a center for medical care and research, treating nearly 250,000 people every year.

■ **Industry and Location**
  Healthcare, Essen, Germany

■ **Product and Services**
  SUSE Enterprise Storage
  SUSE Linux Enterprise Server

■ **Results**
  + *Supports soaring data volumes at 70 to 80 percent lower expenditure*
  + *Provides a cost-effective, protected private cloud storage and file sharing environment for researchers and medical staff*
  + *Grants the hospital flexibility to deploy storage resources rapidly as needed*

Michael Nieporte, Head of IT Infrastructure at University Hospital Essen, explains: "With hundreds of thousands of people admitted each year, our storage environment was under constant pressure. We were storing all patient data on mid-range storage devices, which would quickly reach full capacity. This meant that we had to frequently expand or replace our storage systems, which was costly and time-consuming."

He adds: "Storage requirements are increasing all the time. As medical technology improves, so too does the size and quality of medical imaging records, while many departments now also produce surgery videos to support teaching and research. We needed to be able to store more and more large multimedia files."

Already struggling to keep up with growing data volumes, the IT team would soon face an even bigger data storage challenge. Michael Nieporte says: "The Institute of Pathology is currently transforming and digitizing all of its workflows. Once completed, we expect this department with its state-of-the-art technology to generate 300 to 400 TB of data a year. With traditional mid-range storage, that kind of data growth would quickly consume our entire storage budget."

Solution

Recognizing the need for a new storage strategy, University Hospital Essen decided to take advantage of cutting-edge software-defined storage technology.

"We wanted to modernize and expand our storage environment," says Michael Nieporte. "We knew that the traditional appliance approach no longer worked for us as an organization. Rather than having to invest in new, expensive proprietary mid-range storage arrays whenever we needed to expand our storage capacity, we wanted to run open source storage

software flexibly on commodity hardware. We were fed up with purchasing additional storage systems that did not scale cost-efficiently with our data growth. So, we decided to explore whether software-defined storage would be the right fit."

SELECTING SUSE ENTERPRISE STORAGE

University Hospital Essen selected SUSE Enterprise Storage—an innovative software-defined storage solution based on Ceph open source technology.

Designed as a distributed storage cluster, SUSE Enterprise Storage provides a single software-defined storage solution that separates the storage management from the underlying hardware. Regardless of the actual infrastructure, all capacity is combined across multiple storage arrays, and can be grouped into one or several storage pools according to the specific requirements. By expanding a cluster with additional nodes when extra capacity is needed, the virtual storage pools can be scaled essentially without limit, while SUSE Enterprise Storage will automatically redistribute the data to make the best use of the additional nodes.

Michael Nieporte comments: "What initially attracted us to SUSE Enterprise Storage was the sheer flexibility it provides. Software-defined storage frees you completely from the physical constraints of traditional storage environments. We were won over by the fact that SUSE Enterprise Storage is fully supported by SUSE. We didn't want the pressure or risk that comes with managing open source software independently—we wanted the reassurance of having a partner behind us. What's more, having used SUSE® Linux Enterprise Server to support operations for many years, we know from experience that both SUSE software and support are outstanding."

"As open source advocates and early adopters, we did a lot of research into

software-defined storage, Ceph and SUSE Enterprise Storage. Based on our findings, we knew that we needed to select the right infrastructure to support our flexible new approach to data storage."

TEAMING UP WITH THOMAS-KRENN

University Hospital Essen decided to deploy SUSE Enterprise Storage on custom-built hardware appliances from SUSE partner Thomas-Krenn.AG, a leading provider of individual server and storage solutions with a long-standing history of providing hardware for open source solutions. Thomas-Krenn is also a SUSE OEM (Original Equipment Manufacturer) Enterprise Partner.

The hospital selected the SUSE Enterprise Storage Appliance offering from Thomas-Krenn, an all-in-one storage solution that strikes the optimal balance between high performance and capacity. With the SUSE Enterprise Storage Appliance, University Hospital Essen can be confident that the hardware has been tested and optimized for SUSE Enterprise Storage, reducing risk and speeding up the deployment.

Michael Nieporte recalls: "We learned the hard way that expert advice from specialists like Thomas-Krenn and SUSE, who have extensive experience with the solutions, is invaluable when deploying a fast, resilient system. It is crucial to think about the different workloads and analyze the specific requirements of all relevant applications. The partnership between SUSE and Thomas-Krenn meant that by customizing an appliance and following expert advice about best-practice configurations, we got an all-in-one solution, and knew that the hardware had been tested and optimized for SUSE Enterprise Storage."

CHOICE, CONTROL AND CONSISTENCY

Working closely with Thomas-Krenn, University Hospital Essen can specify exactly what performance and capacity it needs.

But the tailoring of the appliances goes further than general sizing, enabling the organization to standardize the servers in detail and even specify how the cables should be laid out in the chassis to streamline installation and maintenance. Thomas-Krenn then rapidly delivered a fine-tuned system that worked smoothly out of the box. Critically, Thomas-Krenn provides support and maintenance services to ensure reliable operation over the full infrastructure lifecycle.

Michael Nieporte comments: "We managed the implementation ourselves, but stayed in close contact with the teams from Thomas-Krenn and SUSE throughout the process. Support from both parties has been great, and we appreciate being able to turn to them whenever we have questions or come across any issues. Working together, we were able to deploy a fast, reliable storage environment with performance that is fine-tuned to meet our specific requirements. Naturally, we are very pleased to see how the partnership between SUSE and Thomas-Krenn has strengthened since we started working with the two."

Results

With SUSE Enterprise Storage, University Hospital Essen gained a flexible, cost-efficient data storage system capable of handling ever-increasing volumes of data. Currently equipped with nine nodes, the hospital's SUSE Enterprise Storage Appliance from Thomas-Krenn offers a total of 300 TB of storage capacity.

Michael Nieporte comments: "We wanted the convenience, scalability and flexibility offered by public cloud services, but we needed the security and control of an on-premises solution. With SUSE Enterprise Storage running on Thomas-Krenn hardware in our own data center, we get the best of both worlds."

SUPERIOR SCALABILITY

Being able to add storage capacity quickly and easily will enable University Hospital Essen to accommodate ever-growing volumes of data within budget.

Michael Nieporte says: "SUSE Enterprise Storage, in combination with Thomas-Krenn hardware and services, helped us to improve data protection without increasing costs. As storage is pooled across nodes, we can expand capacity flexibly and avoid huge investments in storage upgrades.

"It usually takes three months to procure, install and configure a new mid-range storage system and migrate data over. Now, we can simply order a new customized and tested system from Thomas-Krenn, and add its capacity to the storage pool within days—at 70 to 80 percent lower expenditure. With SUSE Enterprise Storage, provisioning and managing storage couldn't be simpler."

SEAMLESS, SECURE FILE SHARING

Next, University Hospital Essen introduced a file sharing service based on SUSE Enterprise Storage. Staff now have easy access to private cloud storage, enabling them to share data securely and collaborate more easily.

By providing employees with a fast and simple file sharing service, University Hospital Essen hopes to minimize the use of shadow IT solutions outside of central control. Michael Nieporte explains: "Because storing and sharing data was fairly complex and time-consuming in the past, there was always a concern that individual departments would bypass the central IT department in favor of a 'quick fix'. And because the data we handle is so important to research, and in some cases highly sensitive, we couldn't run the risk of medical information leaving our network. We certainly didn't want employees using

public cloud storage services. Providing staff with an easy-to-use file sharing service based on SUSE Enterprise Storage means we can deliver the services and capacities they need to get their jobs done while retaining central control over data."

SUSE Enterprise Storage includes advanced protocol features, such as support for the iSCSI protocol, which enables University Hospital Essen to connect Windows and other non-SUSE Linux Enterprise Server instances directly to the storage environment over the hospital's network. This feature ensures that all the hospital's servers and user workstations, regardless of operating system, can access the central storage pools and all the data within them. The ability to use this iSCSI protocol feature and the lower cost of supporting more interfaces enables the hospital to improve reliability, reduce administrative workload, and consolidate storage systems more effectively.

FURTHER IMPROVING SERVICES

The hospital plans to virtualize more SUSE Linux Enterprise Server instances using KVM virtualization technology. This can connect directly via a native protocol to SUSE Enterprise Storage, without the need to use, for example, iSCSI. Looking to the future, University Hospital Essen is also planning to make further use of the iSCSI protocol to connect more systems to the SUSE Enterprise Storage environment.

Michael Nieporte says: "We also want to be able to connect VMware instances directly to SUSE Enterprise Storage volumes over the network. This will allow us to provision simple virtual machines complete with easy access to SUSE Enterprise Storage to researchers, for example, giving them more storage space, better data protection with built-in redundancy levels and enabling them to focus on their work rather than on setting up new servers. We

expect SUSE Enterprise Server, in combination with KVM virtualization, to help us respond faster to employee demands for high-quality IT services."

Moving to SUSE Enterprise Storage also enabled University Hospital Essen to make use of a newer version of the Network File System protocol NFSv4, improving connectivity and the availability of applications. In the past, the team had to coordinate with users before routine maintenance tasks to restart systems. They would also often work late into the evenings to avoid application downtime for users. Thanks to new protocol features, University Hospital Essen can now schedule maintenance more flexibly and avoid working long hours, a highly welcome benefit for the IT team.

As data volumes continue to soar, and as more and more departments look to embrace the digital transformation of workflows, University Hospital Essen can be safe in the knowledge that, with SUSE Enterprise Storage, it can keep scaling its storage environment to meet demand—now and in the future.

Michael Nieporte concludes: "With SUSE Enterprise Storage running on tested and optimized Thomas-Krenn systems, we are confident that we can cope with rapidly increasing volumes of data without breaking the bank. SUSE Enterprise Storage also allows us to offer staff secure file sharing services, facilitating collaboration. With SUSE Enterprise Storage, we're well-equipped to support the hospital's new digitization initiatives."

Contact your local SUSE Solutions Provider, or call SUSE at:

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