Hewlett Packard Enterprise

Case Study

Karlsruhe City Hospital modernizes audit-proof long-term archiving

Gearing up for the data explosion with HPE Converged Storage and iTernity iCAS

Städtisches Klinikum Karlsruhe

Objective
Deploy a sustainable solution for auditable long-term archiving of patient data.

Approach
Migrate from a proprietary appliance system to a flexible, scalable data storage solution based on HPE Converged Storage and iTernity Compliant Archive Software (iCAS).

IT improvements

- Massive scalability of storage capacity
- High reliability and long-term stability of the data storage solution, achieved through mirroring at two sites and technologies such as self-healing
- Virtualization and cloud integration of the data storage solution
- Ability to seamlessly integrate different types and multiple generations of storage products
- The use of self-contained archive containers facilitates data migrations to future data storage systems

Business benefits

- Less data management and lower operating costs for auditable long-term archiving
- Flexibility to embrace changes in technology enables the customer to migrate to new storage systems at any time
- Solid foundation for the continued expansion of storage capacity in pace with rapidly growing demands on hospital operations

Karlsruhe City Hospital, Städtisches Klinikum Karlsruhe, offers its patients high-quality diagnostic and treatment services using leading-edge technology. It is this technology that is driving rapid increases in data volumes, especially from the imaging procedures of modern radiology.

The audit-proof long-term archiving of the resulting data, plus other data that is subject to statutory regulations, places high demands on the performance and scalability of data storage system. HPE Converged Storage systems, controlled by iTernity iCAS, enable the hospital to respond flexibly and cost-effectively to increasing archiving needs.

iTernity
your key to compliance

"With HPE Converged Storage and iTernity iCAS, we have a cost-effective solution for long-term data storage at the hospital. The solution's virtualization capability and its capacity for easy expansion through non-proprietary data storage devices support us in responding quickly and at any time to new requirements coming from the medical field."

— Holger Hussy, Chief Information Officer, Karlsruhe City Hospital

Sophisticated care results in rampant data growth

Karlsruhe City Hospital provides maximum care and offers nearly all medical disciplines on its premises. The number of patients the hospital treats is growing every year. However, the key driver for the hospital's rapid data growth is the continuing development of devices for cross-sectional imaging. These devices include the typical equipment any modern hospital offers, such as: computed tomography (CT), magnetic resonance imaging (MRI), ultrasonography, angiography, and direct radiography, which no longer uses X-ray films, but detectors that deliver data for conversion to digital images.

Another factor contributing to the increase in data volume is the postprocessing of image data stored in the Picture Archiving and Communication System (PACS). "The tools we use during data postprocessing generate their own data, which also must be stored. Our initial calculation to handle five terabytes per year is gradually being tuned towards ten terabytes," says Prof. Dr. Peter Reimer, Director of the Institute for Diagnostic and Interventional Radiology at Karlsruhe City Hospital.

Long retention periods

X-ray and radiation protection regulations require a retention period of at least ten years for diagnostic data and data associated with medical treatment, and this includes electronic medical records. "There are situations, though, where we need to store data much longer, such as in cases of children and adolescents, whose data must be stored to the end of their eighteenth year. And there are cases when we must store it ten years longer, in other words, for 28 years, when, for instance, we X-ray a newborn," Prof. Dr. Reimer explains.

The hospital currently anticipates a trend of around 20 percent data growth per year. According to CIO Hussy: "This is a very conservative estimate. We assume there will be no linear increase in data growth, but an exponential curve that we cannot even estimate yet."

Fresh approach urgently needed

Up until now an EMC Centera system appliance had been used as an archiving solution in the hospital. With this solution, disk storage and servers were housed within the same casing. According to the hospital's IT organization, the system appliance was not up to handling the data explosion they were facing. "From a business point of view, the continued operation of the existing archiving solution would have been a borderline effort," Hussy notes. The hospital's IT organization saw an urgent need to take action, and decided to move to a scalable storage solution that supports virtualization.

"If we had continued to use the existing system appliance, our audit-proof data storage would have continued to depend on dedicated hardware. A change was urgently needed because our strategy calls for flexibility and virtualization of our IT infrastructure. Another postponement would have made the hardware lock-in problem even worse."

— Holger Hussy, Chief Information Officer, Karlsruhe City Hospital

Why HPE Converged Storage and iTernity iCAS?

As the CIO at Städtischen Klinikum Karlsruhe, Hussy attaches great importance to having the highest degree of operational stability, scalability, compactness, and cloud capability. The combination of HPE Converged Storage and iTernity iCAS fulfills these requirements. The data storage systems from HPE are highly reliable, can be scaled as needed thanks to the concept on which HPE Converged Storage is based, and have a very small footprint. Using iCAS as middleware, the new data storage solution integrates seamlessly with the hospital's existing infrastructure that relies on HPE blade server technology. According to Hussy: "The selection of systems in the marketplace is very limited when it comes to cloud integration. That is why during our survey of the market we were able to pinpoint iTernity iCAS as the right solution so quickly."

iTernity iCAS stores archived data, together with the associated metadata, in "file containers". These containers are archived as self-sustained archive objects on the available storage devices. Additional data storage devices, even of different models and product generations, can be added seamlessly at any time. The patented iCAS container technology makes it easy for the hospital to copy its data to additional storage media if and as necessary. Due to architectural constraints, the legacy EMC Centera system appliance did not provide this capability. The new solution takes data integrity and security, as well as a flexibility and scalability, to the next level.

Transparent change-over

During the physical migration of 100 terabytes of the hospital's stored data, the PACS application vendor took charge, while the hospital's internal IT staff were only marginally involved. The switch to the new storage solution, based on HPE Converged Storage and iTernity iCAS, was completely transparent to hospital users. The hospital's data center, including the new data storage solution, is operated by ACP IT Solutions GmbH.

"The combination of HPE Converged Storage and iTernity iCAS gives us an optimal solution for decoupling operating system, server hardware, and hard disk capacity."

— Holger Hussy, Chief Information Officer, Karlsruhe City Hospital

Effective protection against data loss thanks to "self-healing"

As a security measure, the hospital's two long-term archives have been placed in two physically separate locations. Replicating archive files on both storage systems simultaneously, the iCAS "additional write paths" function is instrumental to this strategy. Integrity checks are carried out continuously in the background by the iCAS "self-healing" function. This protection against data loss has already proven itself

Case study
Karlsruhe City Hospital

Industry
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> "We did not notice that the system was changed. Nor did we notice when it was changed. We knew only that it would be changed at some point, but were unaware of the time when the transition occurred."
>
> —Prof. Dr. Peter Reimer, Director of the Institute for Diagnostic and Interventional Radiology at Karlsruhe City Hospital

Customer solution at a glance

Hardware
- Servers: HPE ProLiant BL460C Gen7 and Gen8, HPE ProLiant BL680C Gen7
- Storage: HPE Converged Storage

Software
- General Electric® PACS applications
- Hospital Information System (KIS) Orbis® from Agfa Healthcare
- iTernity® Compliant Archive Software (iCAS®)
- HPE Data Protector®

Städtisches Klinikum Karlsruhe
Karlsruhe City Hospital (Städtisches Klinikum Karlsruhe) has 1,600 beds and employs 4,300 staff. 60,000 in-patients and 170,000 out-patients are treated each year. In 2014, total assets of the hospital amounted to over 290 million Euros. The hospital is the largest in the middle Upper Rhine region. Its catchment area extends to the northern Black Forest and the southern Palatinate regions.

in practice: The "self-healing" function detected that a patient file had not been saved correctly. "The discrepancy was taken care of automatically. No action was required from the hospital's IT staff," affirms Hussy.

The switch pays off

The combination of HPE Converged Storage and iTernity iCAS gives the hospital a very high degree of flexibility both in the operation and in the future expansion of storage capacity. Because the iCAS control software is completely decoupled from the storage hardware, the hospital has the freedom to switch to any storage technologies it chooses, thus eliminating all worries about capacity limits. Compared to the previous data storage solution, the operating and data management costs are lower. "The solution with HPE Converged Storage and iCAS provides our hospital with a very cost-effective way to meet its long-term storage requirements. Low-cost storage media plus data compression are helpful," said Hussy. As to continued data growth, the hospital's IT department faces it with confidence.

Next steps

Following the successful migration of radiology image data, two more steps lie ahead for Karlsruhe City Hospital in the near future: First, data such as physician's letters and medical reports are to be transferred from the existing Hospital Information System (HIS) via a leading Document Management System (DMS) to the new data storage solution for long-term archiving. Second, invoices and other documents from the hospital's SAP system are to be transferred to the audit-proof iCAS archive. Due to its multi-client capability, iCAS can integrate this data easily, thereby serving as a central archive for all of the hospital's critical information.

> "We can meet data growth requirements through the integration of industry-standard storage systems. This means we gain a very simple and cost-effective expansion capability for long-term storage. Ultimately, the business perspective is our key performance indicator."
>
> — Holger Hussy , Chief Information Officer, Karlsruhe City Hospital

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