iTernity

Karlsruhe City Hospital
PREPARED FOR DATA EXPLOSION

MASTERING RAPID DATA GROWTH

„We see the most important advantages of iCAS FS in legal compliance, scalability and vendor independence. The system convinced us and simply does what it's supposed to do—without any effort for our IT team. We can optimally manage the enormous data growth."

Andreas Gürth,
Team Leader IT Infrastructure, Karlsruhe City Hospital

KARLSRUHE CITY HOSPITAL

Industry:

Healthcare

Situation:

The hospital faces rapid data growth. These data must be highly available and archived according to strict regulations. When the previous archive solution needed to be modernized, the clinic sought a maximum scalable storage solution without vendor lock-in that minimized IT efforts, ensured legally compliant archiving, and provided optimal protection against data loss.

Challenges:

- Storing sensitive medical data according to strict regulations
- Enormous data growth
- Management of the storage system should be outsourced

Solution:

iCAS FS by iTernity, HPE Storage, HYDMedia by Dedalus, Centricity PACS by GE, Orbis by Agfa Healthcare, enaio by Optimal Systems, and more.

Image (Karlsruhe City Hospital): Maximum care hospital in the "Middle Upper Rhine" region.

THE SUCCESS AT A GLANCE

✓ Legally compliant and secure archiving of sensitive healthcare data according to GDPR, RöV, StrlSchV, IT-SiG 2.0, etc. thanks to WORM storage, retention management, failover protection and more

✓ Cope with enormous data growth thanks to flexible scale-out storage

✓ Long-term protection of data integrity and availability without vendor lock-in

✓ No effort required for the storage platform: administration, monitoring, updates, and operation are carried out by iTernity

KARLSRUHE CITY HOSPITAL: ENSURING SECURE AND RESPONSIBLE PATIENT CARE

Karlsruhe City Hospital is the largest hospital in the "Middle Upper Rhine" region. As a maximum care facility and teaching hospital of the University of Freiburg, the clinic offers almost all medical specialties and disciplines. With four institutes, 22 specialist departments, a blood donation center, a central emergency room and a children's emergency room, a comprehensive range of health services is available to the citizens of Karlsruhe and the surrounding region.

The clinic's aim is to implement the latest treatment methods in medicine and care based on the latest scientific research results and to orientate its processes accordingly. The goal is to build a largely paperless, comprehensively and securely networked company that operates digitally with customers, partners and staff and to provide patients with safe and responsible care.

MEDICAL IMAGING DATA AS THE DRIVER OF RAPID DATA GROWTH

The Karlsruhe City Hospital is generating rapidly increasing amounts of data. A decisive factor for this is the continuing development of the devices for cross-sectional imaging techniques. 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).

Key data: Karlsruhe City Hospital, as of October 2024

- Maximum care hospital
- Over 4,900 employees
- Around 54,000 inpatients and 197,000 outpatients every year
- Over 1,590 planned beds/places

"The current database amounts to approx. 260 terabytes. The calculated growth rate was originally set at 20% per year. However, due to the many projects that have now started within the framework of KHSF II and KHZG, enormous additional amounts of storage space are being added. Imaging procedures are a big driver here."

explains Andreas Gürth, Team Leader of IT Infrastructure, with regard to the enormous data growth.

In order to archive data in a legally compliant manner, the hospital's IT department decided in 2013 to use the vendor-independent and virtualizable Archive Middleware iCAS from iTernity. This replaced the previously used proprietary EMC Centera System Appliance, which could no longer meet the requirements for flexibility, scalability and independence due to its rigid design.

When the existing archive infrastructure needed to be modernized in 2022, the clinic IT switched to the

Managed Storage Platform iCAS FS from iTernity. Due to almost 10 years of successful use of iCAS and the recommendation of the hospital's IT partner, the decision was quickly made. The IT department sees the main advantage of the archive platform in its maximum scalability, which optimally addresses the unpredictable growth of data. iCAS FS acts as a scale-out cluster, which can be easily and flexibly expanded by adding additional cluster nodes.

In addition to the image data from the PACS system (Centricity PACS by GE), iCAS FS is currently used to archive commercial and administratively relevant data from a wide variety of hospital applications (e.g. data from Orbis by Agfa Healthcare, enaio by Optimal Systems, data from RIS systems, some data volumes from the SAP system). In the future, iCAS FS is planned to be expanded into a central archive for the entire hospital, ensuring compliant archiving of additional data, such as from the hospital information system (HIS) and pathology. iCAS FS provides optimal conditions for this, as the solution has already been tested and certified for more than 150 software applications from various manufacturers.

„We expect a doubling of data volumes to half a petabyte over the next three years. However, this is simply not yet foreseeable and depends on many factors, such as data outsourcing to the cloud and the further development of AI. In extreme cases, data growth could even reach 1 petabyte. For this reason, the scalability and flexibility of iCAS FS is an extremely important factor for us."

explains Andreas Gürth.

Another reason the hospital chose iCAS FS is its hardware independence. This allows the required storage space to be expanded easily and flexibly, without being tied to specific manufacturers or technologies.

„Legal compliance, scalability and manufacturer independence are the three most important advantages that we see in iCAS FS. The iCAS FS solution best suited the requirements of our hospital. iTernity has a strong presence in the healthcare sector, and for good reason. During the selection process, we also evaluated which solutions other hospitals are using and their experiences with them. The feedback for iTernity was very positive, and the technology convinced us. The system simply does what it is supposed to: archive enormous amounts of data in a legally compliant manner without any effort."

summarizes Andreas Gürth.

EFFECTIVE DATA PROTECTION: STRICT REQUIREMENTS FOR CRITICAL INFRASTRUCTURES

The retention periods in the hospital for most of the data are 10 or, in some cases, 30 years. During this time, the data must be stored with special protection and must not be altered or deleted. With regard to data and audit security, specifications such as the GDPR, the GoBD and the X-ray and Radiation Protection Ordinance specify corresponding requirements.

Since the Karlsruhe City Hospital is classified as critical infrastructure (KRITIS), its IT department must comply with strict requirements set by the IT Security Act 2.0. Among other things, appropriate measures must be taken to prevent disruptions to IT systems, components, or processes. This also affects the reliability of the archive system as well as the availability, integrity, authenticity and confidentiality of the stored data.

For this reason, the clinic stores data redundantly on two iCAS FS cluster nodes, which are located in two different data centers. If one of the nodes is not available, the data is written to the other available node. Once both nodes are available again, data is automatically synchronized and full redundancy is restored. iCAS FS offers transparent read/write failover and active-active cluster. All nodes perform the same services simultaneously and step in for each other in the event of a failure. This capability is an important factor in ensuring data availability and protection against natural disasters and human and technical errors. iCAS FS thus provides an important component for the security of the processed patient information and the functionality of the hospital.

In addition, compliance features such as WORM storage, encryption and retention management ensure the long-term integrity and audit security of patient data.

Thanks to its various functionalities, iCAS FS forms the basis for data protection and GDPR-compliant storage. This ability has also been independently audited and certified by KPMG.

NO EFFORTS THANKS TO MANAGED STORAGE

The shortage of IT specialists is also noticeable in the hospital. For this reason, the IT department decided to outsource the majority of its systems to an external provider using managed services - including the iCAS FS storage platform.

As part of the Managed Storage Services, iTernity takes full responsibility and complete management of the iCAS FS storage platform: implementation, monitoring, troubleshooting, configuration changes, updates, patches and administration. As a result, the hospital's IT department no longer has any points of contact with the iCAS FS system. At the same time, the clinic retains full control and sovereignty over the data, as the solution is operated in its own data centers.

"Since its implementation, we have had virtually no effort with the iCAS FS storage system. iTernity is the data archiving specialist and manages the solution better than any in-house employee at the hospital could have done. This is a huge advantage for us and

makes our work a lot easier."

summarizes Andreas Gürth.

LOOKING INTO THE FUTURE: RANSOMWARE PROTECTION & CO.

In addition to the expansion into a clinic-wide central archive and the connection to pathology, Andreas Gürth sees iCAS FS as a future component in the hospital's overall backup concept, as iCAS FS can be used not only for data archiving but also for backup storage.

The backups in the clinic are currently secured offline. With iCAS FS, however, archive and backup data can be stored online in a ransomware-protected manner via the S3 interface. This is made possible by immutable storage: data is written once and can no longer be changed or deleted - neither by ransomware nor by employees. Furthermore, iCAS FS does not offer any administration access on the customer side, which minimizes the attack surface for cybercriminals.

Further KHZG, KHSF II and digitalization projects are also being planned, including the introduction of a HIS system, which will continue to fuel data growth and lead to an expansion of the iCAS FS storage system.

"I am very satisfied with iCAS FS and want to stick with the solution. If we could also secure our backups via S3, that would be another benefit for us."

Andreas Gürth concludes happily.

UNLIMITED SCALABILITY FOR LITIMTED IT BUDGETS

iCAS FS is a scale-out platform for archive, backup and business critical data of all kinds. The software-defined storage platform scales without limits starting at 40 TB, and impresses with low TCO, great ease of use and high flexibility.

53% cost savings compared to public cloud storage and you retain the control of your data
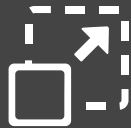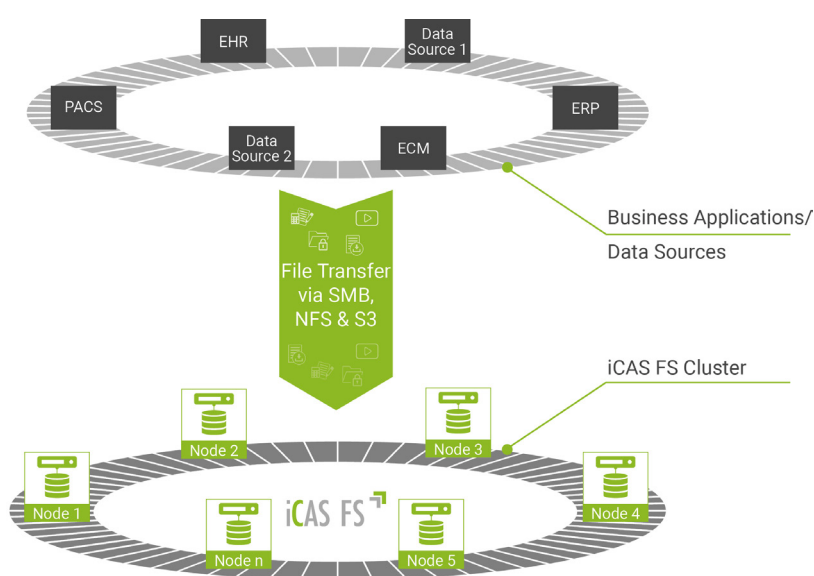
Start small, scale without limits from one node and 40 TB in one software-defined platform

The advantages of public cloud storage in your own data center: high flexibility, easy scalability, little effort

Auto-managed system: zero-touch operation and managed services with monitoring of the complete system

iCAS FS enables future-proof data storage and compliance at a low total cost of ownership. The platform is ideal for storing and protecting data from multiple applications and sources and enables audit-proof archiving, ransomware-proof backup storage, and relieves your primary storage.

The software-defined architecture is built on standard hardware and a Linux operating system. Thanks to WORM storage, S3 Object Lock, retention management, encryption and audit trail, compliance and security are top priority, which has also been confirmed by KPMG.

WOULD YOU LIKE TO LEARN MORE?

Arrange a demo or discuss your requirements with us:
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