Medizinische Hochschule Hannover

ACCELERATING COVID-19 RESEARCH

The Medizinische Hochschule Hannover (MHH) is one of the most research-intensive medical universities in Germany. While the hospital offers maximum care to patients nationwide, the university teaches more than 3,000 students in the subjects of medicine, dentistry, midwifery, and health sciences.

Since the outbreak of the coronavirus pandemic, doctors and researchers at the MHH have been dealing with all the issues relating to the virus. Since the spring of 2020, the university has been making anonymized patient data available in a public database. Doctors, healthcare, and research institutions around the world can use this data to better understand the virus and optimize treatment methods. The university is storing the growing volume of patient data that it has amassed during the COVID-19 pandemic securely and reliably in the Open Telekom Cloud.

The public cloud solution offers flexible storage resources and automatic scaling as data and user numbers grow. And it is making the MHH fit for the future: The university is being given the opportunity of using innovation to gain new added value with the Open Telekom Cloud, as a basis for AI-supported data analysis.

AT A GLANCE

The Task: For one of the largest machine-readable and public databases of anonymized data of COVID-19 patients, the MHH was looking for a secure and reliable storage location in the German legal area with a consistently high level of performance, even with an increasing data volume.

The Solution:

- Data storage in highly secure, data-protection-compliant Open Telekom Cloud
- Object Storage Service (OBS) with automated backup, all data always mirrored, high availability of up to 99.95 percent
- 24/7 operation exclusively by T-Systems

The Advantages:

- Flexible storage resources and automatic scaling with increasing data and user numbers in the pay-as-you-use model
- Access to public, anonymized, and data-protection-compliant data
- Faster and more efficient control of the coronavirus

THE CUSTOMER

Whether research, patient care, or teaching: with its more than 7,500 employees, the MHH is one of the most effective and research-intensive medical universities in Germany.

THE CHALLENGE

PCR, antibody, or rapid test: Since the outbreak of the coronavirus pandemic, several test methods have been established to detect the SARS-CoV-2 virus in the human organism. Sometimes, however, these kinds of tests and the associated diagnostic procedures can reach their limits. Here, thorax X-rays can provide more specific information, even if the tests are negative.

The MHH doctors also use X-rays, especially in severe cases, to better assess the course of the disease and to detect possible complications early on. To ensure that doctors, researchers, and healthcare institutions worldwide also benefit from the COVID-19 data collected and the knowledge gained from it, the MHH decided to publish the X-ray images and additional information in April 2020. All patient data was to be made available on the Internet in a secure and anonymous form, in compliance with data protection laws. The result was one of the largest public databases with machine-readable, structured COVID-19 patient data. It serves as a basis for intelligent analyses, with the potential to provide important information for research and to help fight the disease.

THE SOLUTION

Since the MHH enriches the lung X-ray images with age data as well as blood and cell analyses of the patients, huge amounts of data are generated. However, the Github development platform used by the team so far only allowed the storage of metadata. Higher capacities were required to process and store all the X-ray images. The university also had major reservations about storing the data in a US cloud platform. The Open Telekom Cloud promises data protection, something that is lacking in US hyperscalers.

The most important factor that convinced the MHH to choose the Open Telekom Cloud was the fact that it was designed in accordance with Deutsche Telekom's strict and proven security and data protection standards, and that the operation in Europe's

most modern high-security data center is carried out exclusively by T-Systems. Today the MHH uses the Object Storage Service (OBS) from the Open Telekom Cloud as a secure storage location in Germany.

Users worldwide access the metadata of images and patient data via the Internet in Github, which are then uploaded from the Open Telekom Cloud via a direct link. In order to work exclusively with data that does not reveal any information about the identity of the patients, the MHH anonymizes the data retrospectively at 30-day intervals and only shares ranges of values, but no exact figures.

THE CUSTOMER BENEFITS

The Object Storage Service (OBS) of the Open Telekom Cloud enables fail-safe storage of very large amounts of data with minimal operational effort. OBS already includes automated backup as standard, so that all data is always mirrored and highly available. The agreed SLA provides for an availability of up to 99.95 percent, which in 24/7 operation corresponds to an annual downtime of just four hours maximum. The pay-as-you-go model offers a flexible and transparent cost framework.

Currently, about 100 users use the database every month. They work with an average data volume of 200 gigabytes. By way of comparison, an X-ray image is usually 18 megabytes in size and a CT scan almost one gigabyte. If more users access the database in the future, the installation on the Open Telekom Cloud can be expanded at short notice to include any cloud resources or potential areas of application such as artificial intelligence for data analysis.

CONTACT:

www.telekom.de/geschaeftskunden
E-mail: geschaeftskunden@telekom.de

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Landgrabenweg 151
53227 Bonn, Germany

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