



SUCCESS STORY
Education



UNIVERSITY OF GIESSEN | PROBLEM SOLVED

The University of Giessen turned to NetApp® SolidFire® technology to support its analytic software services, enabling researchers worldwide to solve pressing challenges in medicine and biotechnology.

21st-Century Research Flourishes in 12th-Century Town

Giessen began as a moated castle in 1150 and was officially named a city in 1248. Now it's home to some of the leading medical research that will save lives in the twenty-first century. Justus Liebig University Giessen is a large public research institution in Germany that develops software to analyze the genetic material of microorganisms that affect medicine and biotechnology. For the extensive storage capabilities that are needed to serve customers and collaborators, the university's Institute for Systems Biology relies on scale-out, all-flash storage from NetApp SolidFire.

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Alexander Goesmann

Professor of Bioinformatics and Systems Biology, University of Giessen

DELIVERING WORLDWIDE ANALYTICS FOR MICROBIAL BIOINFORMATICS

Science is thriving throughout the University of Giessen. Doctors develop a treatment plan for a hospital patient’s antibiotic-resistant infection. A biologist investigates the spread of pathogenic bacteria and how to prevent a local outbreak from becoming a world pandemic. A researcher explores the promise of synthetic biology for medical or environmental benefits. Colleagues from the Fraunhofer Institute for Insect Biotechnology and Bioresources conduct intensive research to investigate the unique characteristics of insects in cooperation with symbionts by analyzing their genomes and transcriptomes.

To support all of these scenarios, for close to 20 years the group around Professor Alexander Goesmann has developed software tools for analyzing microbial genomes. In partnership with Bielefeld University, the University

of Giessen runs a microbial bioinformatics service center within the German Network for Bioinformatics Infrastructure (de.NBI) that serves approximately 2,500 researchers who conduct about 300 projects worldwide. Among others, the researchers use the center’s EDGAR software platform to compare dozens or even hundreds of bacterial genomes, encoding specific properties of each organism under study. The software provides both analytic muscle and user-friendly visualizations for extracting meaning from large datasets.

“This platform has probably the most comprehensive set of features and analysis functions available,” says Goesmann. “That is why so many people are using it around the world—and we’re adding up to 10 new users every week.”

Goesmann is a professor of bioinformatics and systems biology at the University of Giessen and leads the University’s

Institute for Systems Biology, the de.NBI partner.

Researchers bring varied use cases and application scenarios to the center’s infrastructure services. Some have datasets of just a few dozen gigabytes; others have datasets of hundreds of gigabytes. Some projects are conducted in a cloud environment; others use a traditional client-server architecture and high-performance computing. The center must accommodate all of them with reliable 24/7 access despite the growing overall demand and unpredictable workload surges.

To meet this need, the center aimed to virtualize its IT environment by using both OpenStack and VMware platforms and Docker software containers. This plan required a new approach to storage.

“We have a heterogeneous setup for bioinformatics tools and workflows, and we always have to achieve our goals quickly—for

instance, if there's a disease outbreak," says Dr. Marc Bruckskotten, one of the center's system administrators. "We needed storage that can handle this in a simple way."

HIGH PERFORMANCE, INTEGRATION, AND SCALABILITY

The center's traditional NFS and FAS solutions did not provide the required high reliability, easy integration with OpenStack and VMware, high I/O performance, seamless scalability, and easy maintenance by a small team of system administrators. After evaluating nearly a dozen storage solution options—all-flash, hyper converged, and others—the center chose scale-out, all-flash storage from NetApp SolidFire.

"We wanted something that we just plug in another node and it scales automatically to deliver more performance," Goesmann says. "With

SolidFire, we have extensibility, guaranteed quality of service for a stable production environment, and seamless integration."

MCS GmbH, a German software development, IT systems engineering, and cloud solutions company, helped—in contact with NetApp resources—to select, configure, and implement a solution. Goesmann has worked with MCS for about 15 years. "It's important to have a reliable partner and fast communication, so when there's an incident with hardware or when we need new solutions, we have someone who has the right expertise and contacts," he says.

DRAMATIC ADVANCES IN MEDICINE AND BIOTECHNOLOGY

In the research world, one way to measure impact is by the list of publications. Not only do the

center's collaborators publish extensively, but their work often affects world health.

"Our software helps to understand the origins of pathogenic bacteria and how to avoid the spread of outbreaks," Goesmann says. "With researchers relying on us for this important work, the NetApp SolidFire scale-out features and quality of service are essential."

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