

WELLCOME TRUST SANGER INSTITUTE SUPPORTS GENOME BREAKTHROUGHS WITH RED HAT



SOFTWARE AND SERVICES

- Red Hat® OpenStack® Platform
- Red Hat CloudForms
- Red Hat Enterprise Linux®
- Red Hat Satellite
- Red Hat Consulting

The Wellcome Trust Sanger Institute is a global incubation center of excellence for genomic discovery. The institute collaborates with startups, pharmaceutical companies, governments, and research centers worldwide. However, its previous IT environment lacked the flexibility to meet growing and evolving research needs. With help from Red Hat Consulting, the institute used Red Hat OpenStack Platform and other Red Hat technology to create a hybrid cloud environment for its scientists, including a Science-as-a-Service offering for tenants of its new facility.



LIFE SCIENCES

1,000+ EMPLOYEES

“We work with a range of organizations, from startups to pharmaceutical giants to national healthcare providers. They need assurance our systems are reliable and secure. We can offer that assurance with Red Hat OpenStack Platform.”

DR. TIM CUTTS
HEAD OF SCIENTIFIC COMPUTING,
WELLCOME TRUST SANGER INSTITUTE

BENEFITS

- Expanded data capabilities by deploying a self-service catalog to offer researchers rapid, on-demand access to computing resources
- Improved support for research collaboration, including greater stability and support for sharing work
- Gained access to expert support and knowledge with Red Hat Consulting



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SUPPORTING SCIENTIFIC RESEARCH COLLABORATION

The Wellcome Trust Sanger Institute, one of the premier centers of genomic discovery and understanding worldwide, provides a foundation for collaborative healthcare research and innovation. The Institute seeks to share its discoveries and techniques with genomics scientists and researchers worldwide. Recent success include breakthroughs on rare birth defects, eye cancer, and the tracking of MRSA (Methicillin-resistant *Staphylococcus aureus*).

The Institute's work involves massive volumes of data. Sanger must sequence a large number of DNA samples to look for variants. To complete this work—and collaborate effectively—the Institute needs to access and share this data quickly, securely, and reliably.

“Collaboration is vital to a lot of our projects,” said Dr. Tim Cutts, head of scientific computing at the Wellcome Trust Sanger Institute. “Because genome mutations are so varied, and patterns are so hard to spot, we need a large sample size. Reaching that amount of data involves working with other genome centers around the world.”

The Institute supports local, national, and international scientific communities, including several long-term investment projects hosted at its Cambridge location. More than 1,500 tech companies have set up in the city over the past 20 years, and the University of Cambridge has invested more than £1 billion in tech startups.

Previously, the Sanger Institute relied on a clustered computing infrastructure to host and support these research efforts. However, the environment proved too inflexible for the Institute's existing and anticipated collaboration needs.

“We want users to be able to run and control workloads in an environment that is safe and secure from a corporate point of view,” said Cutts. “Users should be able to run analysis using software from another organization, but with the necessary data protection.”

In addition, the Sanger Institute sought to provide tech startups on its campus with flexible, utility-based IT service options. “Startups and projects between firms need to be able to procure resources quickly and easily, with minimal upfront cost,” said Cutts. “We wanted to provide that capability through a Science-as-a-Service offering.”

ESTABLISHING AN OPEN SOURCE I.T. FOUNDATION

To build this service catalog for internal Sanger users and campus tenants, as well as manage its complex hybrid cloud environment, the Sanger Institute chose Red Hat OpenStack Platform. The Institute selected Red Hat's solution due to its positive experience using Red Hat Enterprise Linux and Red Hat Satellite as the foundation for its IT environment, among other factors that include effective support for innovation.

“We want technology that is modern and innovative, just like our work. So we wanted a partner with a strong understanding of technology trends,” said Cutts. “But we have to strike a balance. Open source is a very fast-moving area, but Red Hat has more than 20 years of experience. This longevity proves that Red Hat offers stability, but they've also proved they can develop new services.”

In addition to Red Hat OpenStack Platform, the Institute deployed Red Hat CloudForms. This solution unifies management of the Institute's VMware and OpenStack environments through one tool. It also provides support for other platforms, including public cloud offerings such as Amazon Web Services (AWS) and Microsoft Azure.

“I never had the impression that we were being sold something. The technology knowledge transfer was excellent, and the advice was very practical, step-by-step, and risk averse. That approach helped build our confidence in the solution—and in Red Hat as a partner.”

PETER CLAPHAM
HEAD OF THE HYBRID CLOUD PROJECT,
WELLCOME TRUST SANGER INSTITUTE

To meet strict deadlines related to the opening of a new facility, the Sanger Institute engaged Red Hat Consulting to ensure implementation was completed on time. For example, Red Hat consultants offered expertise in designing and building the Red Hat CloudForms environment to ensure it was connected seamlessly to the existing VMware environment and Red Hat OpenStack Platform.

“Effectively, we had three months to build everything,” said Cutts. “It all had to be up and running by the time people moved into the building. We’d already done a lot of the OpenStack work ourselves, so we needed Red Hat to validate that it worked—and CloudForms was completely new.”

In addition, Red Hat consultants worked closely with Sanger’s IT team to provide related technology knowledge and guidance on how to use the new environment effectively.

“We wanted to establish best practices without building ourselves into a corner, and there were a couple of commercial aspects that were new to us, like understanding how to bill users accurately,” said Cutts.

The Red Hat solution is now fully operational for the building’s five tenants and will soon be fully operational for internal users.

“We have three petabytes of storage, 6,000 cores, and 100GbE [Gigabit Ethernet] networking, and we’re hoping to add more as the platform evolves,” said Peter Clapham, informatics support group and hybrid cloud project team leader at the Wellcome Trust Sanger Institute.

IMPROVING RESEARCH WITH INNOVATIVE TECHNOLOGY STABLE YET FLEXIBLE DATA CAPABILITIES

The new service catalog based on Red Hat OpenStack Platform offers on-demand access to computing resources. Users can create and share virtual machine (VM) images, as well as transfer small files and find and spin up images from other sources.

“This capability lets us conduct complicated analysis on worldwide data, with confidence that we can comply with data integrity or governance regulations. We can focus on the science,” said Cutts.

IMPROVED SUPPORT FOR COLLABORATION

With its Red Hat environment, the Sanger Institute can take advantage of an opportunity to better support critical collaborative research that contributes to national and international projects. Although the Institute’s deployment is fairly new, using a robust open source solution promises to simplify collaboration.

“We work with a range of organizations, from startups to pharmaceutical giants to national health-care providers,” said Cutts. “They need assurance our systems are reliable and secure. We can offer that assurance with Red Hat OpenStack Platform.”

A key factor in providing reliable support for research is offering the ability to reproduce and share work. With Red Hat CloudForms, the Institute can offer this capability.

“The ability to reproduce work is a key issue in collaborative science. Once you’ve encapsulated a workflow in a container or virtual machine, you know it’s going to work elsewhere. We can prove the science has worked,” said Cutts.

ACCESS TO EXPERT GUIDANCE AND KNOWLEDGE

With Red Hat Consulting, the Sanger Institute gained access to expert support and guidance during implementation of its new environment.

“Beyond the technology, Red Hat was able to deliver the training, documentation, and testing we needed,” said Clapham. “We did not have the impression that we were being sold something. The technology knowledge transfer was excellent, and the advice was very practical, step-by-step, and risk averse. That approach helped build our confidence in the solution—and in Red Hat as a partner.”

CONTINUING SUPPORT FOR INNOVATIVE SCIENCE BREAKTHROUGHS

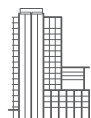
The Sanger Institute expects to support nine additional tenants in its new facility in the near future using its new IT environment and service offerings based on Red Hat technology.

“It’s very early days for Science-as-a-Service,” said Clapham. “I think it will come into its own when companies start to collaborate and develop spin-off projects. This building has been designed to encourage ideas and collaboration, and I’m sure users will find new ways of using our platform once they start to engage.”

ABOUT WELLCOME TRUST SANGER INSTITUTE

The Wellcome Trust Sanger Institute is a world leader in genome research and aims to deliver new insights into human and pathogen biology that change the course of biology and medicine. Our mission is to use genome sequences to increase understanding of human and pathogen biology in order to improve human health.

ABOUT RED HAT



Red Hat is the world’s leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.



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