CUSTOMER CASE STUDY

EMBL-EBI SUPPORTS COLLABORATIVE RESEARCH WITH RED HAT OPENSTACK PLATFORM

EMBL-EBI

SOFTWARE AND SERVICES

Red Hat® OpenStack® Platform

Red Hat Consulting

HARDWARE

NetApp storage system

To support advanced scientific research, the European Bioinformatics Institute (EMBL-EBI) makes data from life-science experiments freely available worldwide. EMBL-EBI provides essential infrastructure, supported by an internal cloud platform, to help researchers discover, access, analyze, and share datasets quickly and easily. To ensure flexibility and scalability of this platform, the institute worked with Red Hat Consulting to deploy Red Hat OpenStack Platform. It also worked with Red Hat consultants to rapidly gain the skills to deploy and manage the new solution in-house. As a result, EMBL-EBI can better support global collaboration and make ever larger datasets generated by DNA sequencing and other technologies available for public download.

"Many scientific collaborations are possible with a centralized resource like Embassy Cloud. It allows people working at different levels, in different locations, to access the information they need, when they need it, and run complex analysis in a secure, contained environment."

STEVEN NEWHOUSE
HEAD OF TECHNICAL SERVICES, EMBL-EBI

BIOLOGICAL AND BIOMEDICAL SCIENCES

570 EMPLOYEES

BENEFITS

- Improved access to data for global research collaboration
- Greater flexibility and scalability of publicly funded data infrastructure
- Enhanced skills through a mentoring-based approach enabled the institute to run the solution in-house

IMPROVING DATA ACCESS FOR COLLABORATIVE SCIENCE RESEARCH

The European Bioinformatics Institute (EMBL-EBI) supports scientific collaboration by performing innovative research and providing advanced bioinformatics training. On an average weekday, EMBL-EBI receives more than 16 million requests for its data services.

"Our former director often said that most of the world's biggest challenges, from healthy aging to food security to biodiversity, come down to biological factors," said Steven Newhouse, head of technical services at EMBL-EBI. "Our focus is making data from publicly funded experiments available to help researchers find solutions to these challenges."

To provide a common IT infrastructure for research organizations of all sizes, EMBL-EBI launched a new service: Embassy Cloud. Embassy provides private, secure workspaces based on virtual machines (VMs) within EMBL-EBI's infrastructure. In these workspaces, collaborators can take advantage of their customized workflows, applications, and datasets alongside large publicly available databases.

"EMBL-EBI is involved in a number of major global collaborations, including the TCGA [The Cancer Genome Atlas] Pan-Cancer analysis project," said Andy Cafferkey, technical team leader at EMBL-EBI. "Embassy Cloud allows us to provide a resource space for these collaborations, where teams can deploy and self-administer a virtual environment according to their needs, as well as access public data offerings."

To support the Embassy Cloud platform, EMBL-EBI needed cost-effective, flexible technology. Previously, the institute used VMware vCloud, but it needed on-demand scalability to thousands of cores and petabytes of storage capacity.

"The life sciences have a long tradition of collaboration," said Guy Cochrane, data coordination and archiving team leader at EMBL-EBI. "Because of data sharing, there is a huge wealth of biological data in the public domain for scientists to explore. However, considering that there are around 3 billion base pairs in a single human genome, you're going to need a lot of power to compare thousands of them at once. Not every research institute can supply the necessary computing power routinely, but EMBL-EBI lets researchers work directly on our infrastructure."

DEPLOYING AN OPENSTACK SOLUTION FROM A TRUSTED VENDOR

To provide a robust, scalable platform for Embassy Cloud, EMBL-EBI sought a solution that offered effective technology and local support during implementation and beyond.

"We had tight deadlines and needed to move quickly. And while we're happy to find solutions in-house, we wanted local, face-to-face contact during the design and installation phase," said Cafferkey. "We knew we needed OpenStack, as it was the emerging standard and has become accepted in the research community."

EMBL-EBI has used Red Hat Enterprise Linux® since migrating from CentOS in 2012. As a result of its previous success with Red Hat's platform and support services, the institute decided to implement Red Hat OpenStack Platform to support Embassy Cloud.

"We see Red Hat as a trusted technology partner," said Cafferkey. "Plus, Red Hat was the only OpenStack provider who could offer us European support. There is no substitute for being able to talk things through with people face-to-face."

The institute engaged Red Hat Consulting to help architect and implement the installation and train their in-house infrastructure team. This training helped EMBL-EBI operate the new solution effectively and gain the skills to manage the new solution in-house.

"We wanted to ensure a skills transfer. Because we would operate the cloud, we needed to understand exactly how it is put together," said Cafferkey. "We often need to find custom solutions to complex problems, so building our in-house expertise is key. We have a lot of very technical people working here who enjoy the challenge. It's part of our culture."

"Plus, Red Hat was the only OpenStack provider who could offer us European support. There is no substitute for being able to talk things through with people face-to-face."

ANDY CAFFERKEY
TECHNICAL TEAM LEADER, EMBL-EBI

EXPANDING SUPPORT FOR WORLDWIDE RESEARCH

EASIER DATA ACCESS FOR COLLABORATIVE RESEARCHERS

With Red Hat OpenStack Platform, EMBL-EBI can provide faster, easier access to data for researchers around the globe.

"Feedback from users has been positive," said Cafferkey. "The cloud just works; users simply have the access to the data they need. The Pan-Cancer project, for instance, has been able to complete large parts of its computational research using OpenStack to access data at EMBL-EBI."

Another example is COMPARE, a European research initiative that aims to speed the detection of and response to disease outbreaks among humans and animals worldwide. COMPARE researchers need to share and process genome data very quickly. With the new capabilities provided by Red Hat OpenStack Platform, Embassy Cloud better supports this work.

"Projects like COMPARE need the kind of infrastructure provided by EMBL-EBI," said Cochrane. "Pathogen surveillance is extremely important, and infrastructure that removes technical barriers is key to our progress. The research community needs to be able to report the freshest incoming data into a structured, central system, such as our European Nucleotide Archive [ENA] and apply custom, rapid, high-throughput analysis. With Embassy Cloud, we can offer efficient access to centrally shared data and support analysis using a widely available OpenStack environment."

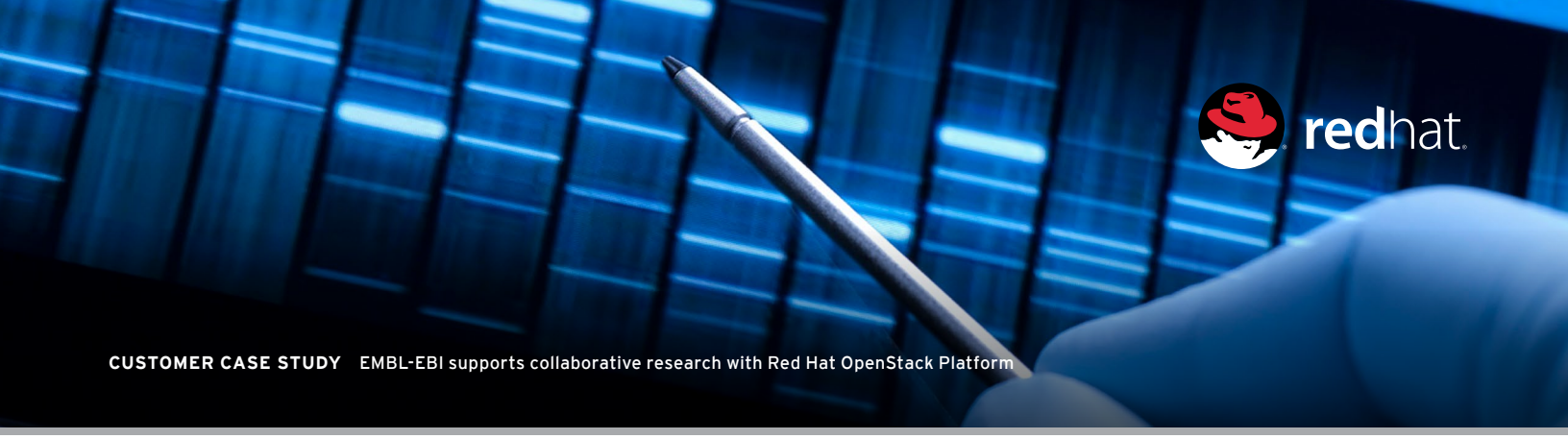
GREATER FLEXIBILITY AND SCALABILITY

In addition to better data access with Red Hat OpenStack Platform, EMBL-EBI has improved the flexibility and scalability of EMBL-EBI Embassy Cloud to provide private, secure collaboration workspaces within its infrastructure.

ENHANCED SKILLS

After the initial implementation, Red Hat OpenStack Platform is now managed and maintained by EMBL-EBI staff.

"The skills transfer happened quickly and efficiently," said Cafferkey. "Our needs are constantly evolving, and at any moment our team may be given a complex problem that requires a solution quickly. It wouldn't have been possible for us to handle this level of change and manage our cloud platform without the time Red Hat took to train us and transfer essential skills."



CUSTOMER CASE STUDY EMBL-EBI supports collaborative research with Red Hat OpenStack Platform

SCALING TO CONTINUE INNOVATIVE RESEARCH SUCCESS

With Red Hat OpenStack Platform, EMBL-EBI has expanded the capabilities of their own staff as well as researchers worldwide.

Following their initial successful implementation, the institute has expanded the project from 2,000 to 4,000 cores. In addition, the institute plans to expand Embassy Cloud to 6,000 cores and 4PB of storage capacity.

ABOUT EMBL-EBI

EMBL-EBI is part of the European Molecular Biology Laboratory (EMBL), an international, innovative and interdisciplinary research organization funded by 22 member states and two associate member states. It is situated on the Wellcome Genome Campus in Hinxton, Cambridge, UK, one of the world's largest concentrations of scientific and technical expertise in genomics.

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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