EMBL
LIFE SCIENCES

EMBL

aspera
an IBM® company

Enabling Molecular Biology Research with High-speed Data Transfer

AT A GLANCE

Industry

Life Sciences

Products

Aspera Connect Server
Connect Browser Plug-in

Challenge

Distributing terabytes of research files and directories to a large number of life sciences research organizations across Europe and beyond.

Solution

Aspera Connect Server powers high-speed transfers between EMBL and partnering institutions, including labs, hospitals and universities.

Results

- Large data sets are reliably distributed in hours instead of days, resulting in faster turnaround times.
- Aspera enables EMBL to distribute 10,000 terabytes of data each yaer at speeds that are 100 times greater than previously.

The European Molecular Biology Laboratory (EMBL) is one of the world's leading research institutions and Europe's flagship laboratory for research in the life sciences. The lab uses public research funds from its member states to carry out research on a range of topics in molecular biology, from genetics to development and behavior.

Collaboration and interdisciplinarity are at the core of the EMBL ethos, and the institute strives to enable scientists to work closely between its five sites in four countries – the main laboratory in Germany and outstations in France, Germany, Italy and the UK (EMBL-EBI) – and with partners throughout Europe and beyond.

EMBL relies on Aspera's patented FASP® high-speed transfer technology to facilitate collaboration through secure exchange of large research datasets between EMBL research units and globally dispersed partner organizations, including laboratories, hospitals, and academic institutes.

CHALLENGE

In support of EMBL's large-scale, interdisciplinary and collaborative research effort, the UK-based EMBL-European Bioinformatics Institute (EMBL-EBI) constructs, organizes and runs a multitude of biological databases. Millions of users consult these databases each year, seeking information on DNA sequences, protein structures, gene expression profiles, human genetic polymorphism and comparative analyses of entire genomes.

To enable researchers to access state-of-the-art technology and specialist expertise, EMBL operates a network of core facilities, including the Genomics Core Facility (GeneCore). GeneCore acts in the rapidly expanding field of next generation sequencing (NGS) equipped with state-of-the-art technologies and operated by highly qualified staff.

GeneCore generates ever-increasing amounts of data from biological samples. Researchers from across Europe and beyond – from small labs to big collaborations like the International Cancer Genome Consortium – send GeneCore their biological samples for analysis, and the results must be distributed back to any location the users request, whether on site or abroad.

In the past, these users typically received their result files via physical shipment or FTP. But relying on physical transport proved problematic. The deliveries could take several days or even weeks and posed security issues. And transfers via FTP or other traditional transfer technologies presented their own problems; performance deteriorated from weak connections, packet loss over the WAN and clogging of the available bandwidth. Because the distribution of these digital assets is time-critical - to preserve swap space to a minimum and ensure fast turnover time - the institute was seeking an efficient, secure and reliable tool to enable high-performance distribution of up to 10,000 TB of data.

aspera
an IBM® company

BENEFITS

Fast transfers
Using Aspera's Connect Server, uploads to and downloads from EMBL's databases are accomplished at maximum speed, regardless of file size, transfer distance, or network conditions.

Ease of use
With an intuitive web-based interface and the self-installing Connect Web Browser Plug-in, Aspera provides ease of use for every researcher, not just technical users.

Reliability
In the event of a network interruption, automatic retry and restart for partial or failed transfers ensures data sets will be transferred dependably.

Strong security
Aspera protects valuable data with a built-in security package that includes encryption in transit and at rest, user authentication and data integrity verifications for each transmitted block. bandwidth while remaining fair to all other network traffic.

EMBL

ABOUT EMBL

EMBL is Europe's flagship laboratory for the life sciences, with more than 80 independent groups covering the spectrum of molecular biology. EMBL is international, innovative and interdisciplinary – its 1600 employees, from many nations, operate across five sites: the main laboratory in Heidelberg, and outstations in Grenoble; Hamburg; Hinxton, near Cambridge (the European Bioinformatics Institute), and Monterotondo, near Rome. Founded in 1974, EMBL is an inter-governmental organisation funded by public research monies from its member states. The cornerstones of EMBL's mission are: to perform basic research in molecular biology; to train scientists, students and visitors at all levels; to offer vital services to scientists in the member states; to develop new instruments and methods in the life sciences and actively engage in technology transfer activities, and to integrate European life science research.

SOLUTION

Influenced by a number of life science research institutions that were already successfully using Aspera's high-speed file transfer solution for efficient data exchange, EMBL deployed the Aspera Connect Server to handle all outgoing data transfers. The new system was directly embedded into their extisting IT infrastructure – making it independent of the end user's system – and the deployment was completed in under two days.

Aspera Connect Server enables authorized users to exchange data with EMBL GeneCore and with EMBL-EBI using the self-installing Connect web browser plug-in. Researchers simply log on to the secure web portal, upload the digital data to be distributed and send it to the respective partner, who can download the data set using a high-speed FASP transfer. Advanced users can implement an automated workflow with an easy-to-use command line tool.

Partner research organizations using the GeneCore facility also benefit from faster turnaround times with Aspera transfers. As soon as EMBL GeneCore receives a biological sample for analysis – nucleic acids from cancer cells, viruses, bacteria, human or any other source – they process it, index it with metadata and compile a comprehensive information package. The results are then delivered back to the users as quickly as possible using Aspera.

RESULTS

Whereas physical shipping methods could take several days, Aspera decreased delivery times to hours or even minutes, saving time and reducing costly shipping fees so EMBL can focus time and resources into new research projects. By simplifying and streamlining the file sharing process, Aspera promotes collaboration between geographically dispersed EMBL research units, labs, hospitals, academic institutes and other participating organizations around the world.

"The Aspera technology proved to be not only fast and reliable, but also secure, as the sensitive data can be encrypted at rest and in transit."

Dr. Jürgen Zimmermann
Senior Engineer Automation, EMBL

Using Aspera, EMBL transports information packages currently reaching up to 30 gigabytes per sample to research partners at speeds that are up to 100x greater than previous rates. As a result, EMBL is able to provide services faster than was previously possible, and users gain valuable time to work on a diverse array of projects, ranging from fundamental research to vaccine development.

The solution enables EMBL to distribute up to 10,000 terabytes of data each year to researchers located around the world with security and dependability, even over poor connections or long distances. Since its implementation, no data loss has been recorded.

"The Aspera technology proved to be not only fast and reliable, but also secure, as the sensitive data can be encrypted at rest and in transit," said Dr. Jürgen Zimmermann, Senior Engineer - Automation at EMBL GeneCore.

About Aspera
Aspera, an IBM Company, is the creator of next-generation transport technologies that move the world's data at maximum speed regardless of file size, transfer distance and network conditions. Based on its patented, Emmy® award-winning FASP® protocol, Aspera software fully utilizes existing infrastructures to deliver the fastest, most predictable file-transfer experience. Aspera's core technology delivers unprecedented control over bandwidth, complete security and uncompromising reliability. Organizations across a variety of industries on six continents rely on Aspera software for the business-critical transport of their digital assets.

Learn more at www.asperasoft.com and follow us on Twitter @asperasoft for more information.