



Connecting genomic researchers with fast transfer of Big Genomic Data

AT A GLANCE

Industry

Life Sciences

Products

Aspera Connect Server

Challenge

Moving genomic research data to investigators and research scientists worldwide.

Results

- Transferred 24 Gigabytes of genomic data from Beijing to California in under 30 seconds.
- Eliminated the costs and risks of shipping hard drives containing Big Genomics Data around the world.

In the age of Big Genomics Data, institutes like BGI are faced with the challenge of sharing large volumes of data between internationally dispersed sample collectors, data analyzers and researchers, a process that up until now has been plagued by unreliable transfers and slow connection speeds due to the inherent throughput bottlenecks of traditional transfer technologies.

BGI developed cloud-based “EasyGenomics™” to make NGS analysis easier and faster. BGI integrated Aspera’s FASP® high-speed transfer technology into the solution to power worldwide secure transfers of genomics data into and out of the cloud, resulting in increased transfer speeds, full bandwidth utilization and improved reliability.

CHALLENGE

Handling the tremendous amount of data generated by NGS had become one of the biggest obstacles to fully benefitting from genomics technology advancements. To liberate scientists from the burden of processing the huge amount of NGS data, BGI designed their cloud-based bioinformatics solution, EasyGenomics™, to provide scientists with high-speed data exchange, easy data and resource management, and point-to-click data

analysis workflows including whole genome resequencing, targeted resequencing, RNA-Seq, small RNA and De novo assembly.

While EasyGenomics was created to make NGS analysis easier and faster, previous methods of exchanging hard drives to get data to partners and customers had proved expensive, prone to human error and overly time consuming. Plus, traditional file transfer protocols were unable to fully utilize available bandwidth, resulting in unpredictable and slow transfers. BGI needed a high-speed file transfer solution that would allow users to rapidly upload sequencing data to the cloud for processing and then quickly download completed projects, speeding up the data analysis process for customers.

“Aspera is the industry standard for the transport and management of large data files produced by life sciences.”

 Sifei He
Cloud Product Director, BGI

BENEFITS

Maximum speed

High-speed data transfers allow BGI to offer scientists and researchers worldwide fast access to Big Genomics Data.

Ease of integration

BGI was able to quickly and easily integrate the Aspera Connect Server into their EasyGenomics platform, providing users with an exceptional customized experience.

Complete security

Built-in, enterprise-grade security features, which include user authentication, data encryption, and data integrity verification, protect valuable genomics data during the entire transfer process.

Extraordinary bandwidth control

Precise rate control provides guaranteed transfer times, fully utilizing BGI's 10 Gbps of available bandwidth while remaining fair to all other network traffic.

ABOUT BGI

BGI was founded in Beijing, China, in 1999 with the mission to become a premier scientific partner for the global research community. The goal of BGI is to make leading-edge genomic science highly accessible, which it achieves through its investment in infrastructure, leveraging the best available technology, economies of scale, and expert bioinformatics resources. BGI, and its affiliates, BGI Americas, headquartered in Cambridge, MA, and BGI Europe, headquartered in Copenhagen, Denmark, have established partnerships and collaborations with leading academic and government research institutions as well as global biotechnology and pharmaceutical companies, supporting a variety of disease, agricultural, environmental, and related applications.

For more info,
visit www.bgiamericas.com
or www.genomics.cn.

SOLUTION

After a successful trial run, BGI chose to integrate Aspera FASP® high-speed file transfer technology with EasyGenomics and deployed the Aspera Connect Server to expand BGI's high-speed sequencing data delivery service.

Using the rich APIs available in the Software Development Kit (SDK) and the Aspera Developer Network (ADN), FASP technology was integrated directly into the web portal, powering high-speed import and export of sequencing data to and from the cloud platform. Easily integrated into any type of digital workflow, the Aspera Connect Server provided a web-based file transfer framework that served as the foundation for the EasyGenomics website, delivering maximum throughput data movement over any distance with end-to-end security and exceptional bandwidth control, regardless of fluctuating network conditions.

RESULTS

Using Aspera, BGI can now offer scientists an effective solution to reduce the time and effort surrounding NGS analysis. In pilot studies at BGI, Aspera's patented FASP transport dramatically improved delivery time, decreasing cost for partners by removing the need for hard drive shipments for sequencing data delivery.

BGI's researchers are now able to successfully transfer genomic data at a sustained rate of nearly 10 Gbps over a new link connecting US and China research and education networks. During a live demo, BGI transferred 24 Gigabytes of genomic data from Beijing to UC Davis in under 30 seconds, while a file of the same size sent over the public Internet a few days earlier took more than 26 hours.

"Aspera is the industry standard for the transport and management of large data files produced by life sciences," said Sifei He, cloud product director at BGI. "Aspera's superior file transfer speed, bandwidth management and reliability coupled with BGI's newly released "EasyGenomics" bioinformatics platform, delivers a powerful solution for our customers and collaborators. Aspera's flexible APIs allowed us to quickly complete the system integration and roll out the new service."

With Aspera, BGI is able to transcend previous barriers of distance and connection speed to make possible a host of new data intensive applications in genomics analysis and medicine in which geography is truly no limit.

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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.