SUCCESS STORY

Healthcare

WuXiNextCODE

WUXI NEXTCODE | PROBLEM SOLVED

WuXi NextCODE, a global leader in genomic data, uses the world's largest genomic datasets to advance understanding of human biology and accelerate drug target and biomarker discovery. Thanks to NetApp, WuXi NextCODE helps life sciences researchers quickly generate insights from processing an unprecedented amount of data—bringing about new ways to address disease.

Genomics and Big Data Analytics Use the Blueprint of Life to Better Understand Disease

Genome sequencing is rapidly becoming the largest source of data on the planet. WuXi NextCODE is creating the world's largest, disease-specific datasets on its unique platform so that biopharma and medical researchers worldwide can easily organize, mine, and analyze the data.

2 BILLION
human genomes will be stored by 2025

Out of the
3.2 BILLION
bases, scientists or researchers might be looking for only a few critical variants

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"What all of our customers have in common is the belief that a genomics-driven approach will improve decision making in terms of truly understanding biological drivers of disease, and a hope that this approach could be a step change in R&D productivity, bringing more efficacious drugs, sooner, to patients who desperately need them."

Rob Brainin
CEO, WuXi NextCODE

Genomics studies DNA sequences, using genetic mapping to better understand the cause of both common and rare diseases, which in turn helps identify improved treatments. Over the past 20 years, researchers have amassed the world's largest database of human genome sequences, with billions of bases of information.

WuXi NextCODE has the only database platform that is purpose-built to handle this type of information. Across four continents, the company's partners can correlate genomic and phenotypic data at unprecedented scale and speed. Company officials like to refer to WuXi NextCODE as the "internet of DNA."

Comparing the DNA of two people, for example, yields millions of differences. WuXi NextCODE's challenge is to examine a large dataset to discover how variations in DNA might be related to disease or protective of health. By analyzing genomic data, including DNA, the company enables biopharma and other organizations to achieve their goal of discovering and developing personalized medicine.

"What all of our customers have in common is the belief that a genomics-driven approach will improve decision making in terms of truly understanding biological drivers of disease," says Rob Brainin, CEO of WuXi NextCODE, "and a hope that this approach could be a step change in R&D productivity, bringing more efficacious drugs, sooner, to patients who desperately need them."

BILLIONS OF BASES

Genomic data is quickly becoming the largest type of data in the world. Scientists predict that up to 2 billion human genomes will be stored by 2025.

Each person's genome sequence is made up of 3.2 billion nucleotide bases (the equivalent of 3.2 billion letters of information) and is 150GB in size. Out of the 3.2 billion bases, scientists must hunt down the few specific variations that are driving disease.

As the company took its technology to the cloud, WuXi NextCODE discovered the storage services in the cloud were not the same as those in the company's on-premises environment. To support its performance and scalability needs, and to integrate with cloud services, WuXi NextCODE chose NetApp® Cloud Volumes Service. The company's platform and service are designed to be cloud vendor agnostic. Because the target customer segment of the service is pharmaceutical companies, most of instances are running on AWS.

"The challenge is to take a dataset of 5 million variants and figure out the differences or mutations that are important—which ones are the causes of a disease, chronic condition, or cancer—to help guide patient treatment," says Dr. Hakon Gudbjartsson, CIO of WuXi NextCODE. "Sequencing the genome allows us to understand the biology of disease. We can discover genomic fingerprints: variants of low frequency but high impact that may be novel drug targets."

HIGH PERFORMANCE EQUALS SUCCESS

Because WuXi NextCODE's platform—based on its proprietary database—needs the potential to

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retrieve thousands of genomes simultaneously, scalability and performance are imperative for the company's storage system. Integrating data on the fly to deliver unprecedented computational efficiency was another necessity because more data makes the company's knowledgebase more useful.

With previous solutions, WuXi NextCODE experienced timeouts and file failures. That changed when the company implemented NetApp Cloud Volumes Service. The service enables WuXi NextCODE to run larger workloads and run them faster than ever before. With faster throughput, WuXi NextCODE can deliver queries more rapidly, which accelerates genomic comparisons against a reference variation database. Additionally, the company found Cloud Volumes Service was easy to set up and expand. This enhances the company's ability to manage a large-scale dataset with fewer resources.

"NetApp has the ability to take a snapshot of data at scale, so it makes testing our implementations much easier with real-world data. Our customers are looking to us to assemble the large and often siloed genomic data they have in house, as well as those available from biobanks, collaborations, or bespoke disease cohorts we offer. The scale of this data is phenomenal and is growing. Our customers demand performance and efficiency," says Irene Blat, scientific director of Translational Genomics, WuXi NextCODE.

Nearly every cell in the human body—from the ones in the fingernails to the ones deep inside the brain—contains a complete set of DNA. WuXi NextCODE makes it possible to access this information more quickly than ever before to enable biopharma researchers to discover new drug targets and biomarkers that have the potential to improve healthcare worldwide.

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