

POWERING THE GENOMIC REVOLUTION

Edico Genome and Dell EMC tackle the big data bottleneck in Next Generation Sequencing

The DRAGEN™ Bio-IT Platform and Dell EMC Isilon storage bundle offer a pre-configured, out-of-the-box solution for ultra-rapid analysis and efficient storage of NGS data.

ESSENTIALS

- **FAST:** DRAGEN Bio-IT Platform achieves NGS data processing speeds orders of magnitude faster than any other method without compromising accuracy
- **ACCURATE:** DRAGEN produces the highest possible accuracy for clinical interpretation and treatment guidance
- **FLEXIBLE:** The DRAGEN Bio-IT Platform couples a DELL Server and Isilon NAS Storage with a cloud archive designed to address the operating requirements of healthcare and life sciences organizations
- **COST-EFFECTIVE:** The combined solution reduces the need for clusters of complex servers and storage, significantly lowering costs related to compute, storage, and IT infrastructure

THE “BIG DATA” DNA SEQUENCING CHALLENGE

The rapid adoption of genomic sequencing has resulted in a constraining bottleneck in the next-generation sequencing (NGS) workflow. With genomic data projected to double every seven months, an alternative solution to CPU-based systems—which can take ~30 hours (BWA-GATK) for analysis of a single genome—is required.

To enable the continued expansion of NGS and personalized medicine, we need an innovative and cost-effective way to reduce the computational time required for NGS analysis—mapping, aligning, sorting, and calling variants—from hours down to minutes, without any compromise in accuracy.

ANALYSIS RESULTS IN MINUTES, NOT HOURS

Edico Genome, creator of the world's first bio-IT platform, DRAGEN (Dynamic Read Analysis for GENomics), has developed such a solution. Optimized for the analysis of NGS data, DRAGEN uses field programmable gate arrays (FPGAs) to provide outputs almost instantaneously, saving customers time and money, while maintaining high sensitivity and accuracy.

Dell EMC and Edico Genome have collaborated to offer a bundled compute and storage solution for rapid, cost-effective and accurate analysis of NGS data. The highly optimized solution integrates Edico Genome's DRAGEN platform into a 2U R730 server, paired with Dell EMC Isilon scale-out networked attached storage (NAS) for ultra-efficient genomic data storage.

This solution enables analysis of a whole genome sequence at 30x coverage in ~20 minutes, a dramatic acceleration over the previous industry standard of ~30 hours. DRAGEN can analyze over 50 whole human genomes (from FASTQ to VCF) in less than a day, reducing the need for clusters of large servers to process data. As a result, users experience lower costs related to IT infrastructure and storage space.

ULTRA-RAPID GENOMIC ANALYSIS PLATFORM AND PIPELINES

DRAGEN is an FPGA-based platform that can be fully reconfigured in seconds to host many different analysis pipelines. DRAGEN currently offers a number of optimized pipelines, including germline, somatic, RNA, and joint genotyping. DRAGEN makes it possible to perform

extremely fast and accurate secondary analysis, resulting in significant cost savings.

RELIABLE & VERSATILE STORAGE

Minimizing analysis time is only one part of the equation. Managing the tremendous amounts of NGS data generated and consumed poses a problem of its own. Edico Genome and Dell EMC's joint solution provides the performance, scalability, and functionality needed to analyze and store such vast quantities of data.

Dell EMC Isilon is a proven scale-out NAS solution that can handle the unstructured data prevalent in end-to-end NGS workflows. Isilon can be used as a central storage system that accepts output from NGS instruments, acts as a primary data storage for a compute cluster, and provides deep capacity for data archiving.

The Isilon storage architecture automatically aligns application needs with performance, capacity, and economics. As performance and capacity demands increase, both can be scaled simply and non-disruptively, allowing work to continue without interruption.

An Isilon storage cluster consolidates large, unstructured file-based data such as FASTQ, BAM, and VCF files into a single system that simplifies solution integration and is transparent to users.

FPGA ACCELERATION

DRAGEN is a fully reconfigurable FPGA-based platform that can be integrated in the R730, an incredibly dense rack server designed to accelerate a range of demanding workloads such as genomics analysis. The R730 delivers outstanding performance, flexibility, and efficiency while reducing space and cost.

ENABLING LIFE SCIENCES WORKFLOWS

Edico Genome ushers in the new era of personalized medicine by enabling customized data-driven insights tailored to the individual. DRAGEN is a reconfigurable platform optimized to accelerate the analysis of NGS data, leading to faster prenatal screening, cancer detection, and diagnosis of critically ill newborns. DRAGEN also facilitates scientific discovery in the laboratory and the development of new therapeutics.

Dell EMC is a global leader and trusted partner in healthcare and life sciences solutions, delivering powerful and versatile compute and storage products for healthcare and life sciences organizations that want to efficiently manage clinical and genomics data. Dell EMC solutions are simple to install, manage, and scale, at any size, across the R&D data lifecycle.



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