

# POWERING THE GENOMIC REVOLUTION

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

### ESSENTIALS

- **FAST:** DRAGEN™ BioIT Processor achieves NGS data processing speeds, orders of magnitude faster than any other method – without compromise
- **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 need for exponentially more DNA sequencing in clinical genomics, biomedical research, and personalized medicine has produced a critical bottleneck in the DNA sequencing workflow. Current solutions often direct increasing numbers of ever more powerful CPU cores at the problem (with a corresponding increase in costs, power and floor space). However, since the data being produced by sequencing already far outpaces Moore’s Law, these solutions have limited sustainability.

What’s required is an innovative way to cost-effectively reduce the computational time required for the NGS data analysis pipeline; a way to reduce time in the mapping, aligning, sorting, and variant calling—currently performed by software on an extensive cluster or cloud-based platforms—from hours down to minutes, and without compromising accuracy.

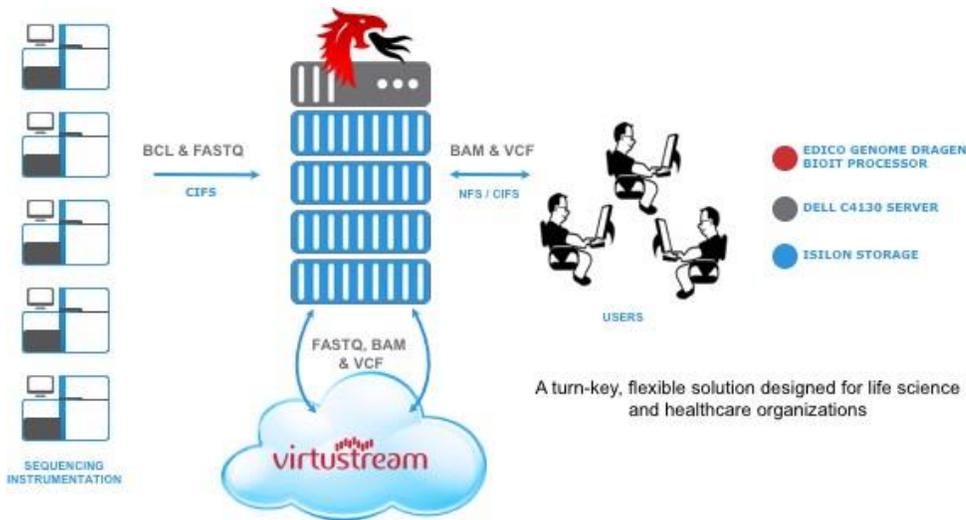
### ANALYSIS RESULTS IN MINUTES, NOT HOURS

Edico Genome—creator of the world’s first bio-IT processor designed to analyze next-generation sequencing (NGS) data—and Dell EMC have collaborated to offer a bundled compute and storage solution for rapid, cost-effective and accurate analysis of NGS data. The highly optimized solution includes the Edico Genome DRAGEN™ BioIT processor integrated into a 1U Dell 4130 server paired with Dell EMC Isilon scale-out networked attached storage (NAS) for ultra-efficient genomic data storage.

The solution enables analysis of a whole genome sequence at 30x coverage in as little as 22 minutes, which can typically take over a day using standard software. DRAGEN can accurately analyze over 50 whole human genomes (from FASTQ to VCF) in less than a day, and reduces the need for clusters of large servers to process the data, lowering costs related to storage space and IT infrastructure.

### A SIMPLE, COMPACT FORM FACTOR

DRAGEN™ uses an FPGA to provide hardware-accelerated implementations of genomic pipeline algorithms and is integrated into a 1U Dell EMC server, optimized with Dell EMC Isilon scale-out storage architecture, and is tightly coupled with the Virtustream Storage Cloud. The solution can be configured to align with application performance, capacity, and economic requirements. As performance and capacity demands increase, both can be scaled simply and non-disruptively, allowing sequencing applications and users to continue working. DRAGEN also features ultra-efficient lossless real-time compression of data that is transparent to the user, reducing a genomic data footprint by as much as 70 percent. End users can access DRAGEN, NGS data, and related applications through the Edico Genome Workflow Management System (WMS), a portal with an easy-to-use graphical user interface.



## RELIABLE & VERSATILE STORAGE

Minimizing analysis time is one part of the equation, however managing the tremendous amounts of NGS data consumed and generated is another. The solution provides the performance, scalability, and functionality required by the Edico Genome workflows.

Dell EMC Isilon Scale-Out NAS provides a highly available and reliable file system for Healthcare-Life Sciences applications and workflows. The Isilon storage architecture automatically aligns application needs with performance, capacity, and economics. As for performance and capacity demands increase, both can be scaled simply and non-disruptively, allowing sequencing applications and users to continue working.

The Isilon storage cluster provides the versatility needed in life sciences and healthcare IT environments. Isilon supports multiple protocols, such as SMB, NFS, Swift and HDFS, across a wide variety of genomics technologies, user access methods and analysis environments. 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.

## EDICO GENOME & DELL EMC ENABLES HEALTHCARE- LIFE SCIENCES WORKFLOWS

Edico Genome ushers in the new era of personalized medicine by enabling customized data-driven insight tailored to the individual. DRAGEN™ is a reconfigurable platform optimized to accelerate the analysis of whole genome, exome, RNAseq, methylome, microbiome NGS data. This can lead to faster diagnoses for critically ill newborns, cancer diagnostics, expecting parents undergoing prenatal testing, and drug development.

Dell EMC is a global leader and trusted partner in healthcare and life sciences solutions. We deliver 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.

In addition, Dell EMC actively participates in industry organizations such as the Global Alliance for Genomics and Healthcare (GA4GH) and the IRODS Consortium with an aim eliminate the complexities of storage so life scientists can focus on research.



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