

CUSTOMER CASE STUDY

Why Icelandic HPC is bioinformatics' best friend

Life sciences and bioinformatics increasingly rely on data-driven technology to enhance the accuracy and speed of research. High performance computing (HPC) is critical to research output and must be underpinned by effective storage and computing resources. However, the high costs connected to HPC hardware and the technology needed to capture, store and analyse huge amounts of research data have previously been a barrier for many in the industry. This is particularly the case for organisations involved in bio-computational workloads where, for example, high-throughput DNA-sequencing instruments generate huge data sets - from a few hundred gigabytes to several terabytes per run.

The UK's Earlham Institute (EI) is one of the world's leaders in life science research, focused on exploring living systems by applying computational science and biotechnology to answer ambitious biological questions. One of a few organisations supported by the Biotechnology and Biological Science Research Council, EI's advanced genomics and computational platforms and data-intensive research drive innovation in modern science.

The Challenge

EI is constantly dealing with large volumes of data arriving at very high velocity. Like any research institute undertaking data-driven science, this puts significant strain on its computing infrastructure, requiring increased storage space and greater demands on the data center hosting capability. Given the sensitive focus and competitiveness of its work, organisations like EI can be reluctant to put all data in the cloud for privacy and security reasons, yet it does require the cloud to facilitate unique collaborations. As such, the Institute needed a strategic data center partner offering scalable, cost-efficient, secure solutions, that could distribute its large-scale genomics and computing biology data analysis but without losing sight of where data is at all times.

The Solution

EI selected Verne Global's data center campus in Iceland because it provides flexible, scalable, secure data center solutions specifically optimised for HPC computing - all supported by a specialist and expert technical team. Also, with access to one of the world's most modern and reliable power grids, utilising 100% renewable energy and uniquely located on a former NATO base, Verne Global offers a highly competitive, secure and low-risk environment for HPC research applications.



We are very excited to be partnering with Verne Global in Iceland, who can not only supply high density computing at significantly lower energy costs, but can also deliver excellent global network communications and data center security.



Dr Timothy Stitt
Head of Scientific Computing, Earlham Institute



Decoding Living Systems

The Results



Sustainable cost-savings

Iceland's advantageous power profile allows EI to access long-term and predictably priced energy, delivering impressive savings and reducing the Institute's total cost of ownership (TCO). Due to the geothermal and hydro-electric sources of power, plus the ambient air cooling due to Iceland's temperate climate, EI will save up to 70% in energy costs - and will significantly reduce its carbon footprint.



A technology first

EI deploys some of Europe's largest shared memory computing resources dedicated to life sciences - including a large, high-throughput compute cluster, comprising more than 4,000 processing cores and over seven petabytes of storage, plus 64 terabytes of the latest Intel NVME Flash technology for demanding critical tasks. These platforms are routinely used by researchers to assemble large and complex genomes. In a first for a UK academic institution, Verne Global's access to the National Research Education Network (NREN) enabled EI to migrate its strategic, collaborative bioinformatics analysis platforms and connect the main campus in Norwich, England with the data center in Iceland.



Leading the way

With Verne Global, EI is keeping UK life science research firmly at the forefront of the data-driven science revolution. Unlike traditional data centers, hyperscale cloud or on-premise options, Verne Global provides EI with the true HPC support critical to its research output. With significantly more DNA-throughput enabled by this technology, its genome sequencing is expected to become even more accurate and unique. Indeed, its very science is underpinned by the storage and computing resources that reside in the Icelandic data center today.



Cross border collaboration

While there's little doubt business demand for HPC will continue to grow, driving increased demand for scalable and secure data center solutions, the partnership between EI and Verne Global illustrates how leading scientific and academic research organisations can embrace HPC across borders and realise their ambitions.

"Modern bioinformatics is driven by the generation of ever increasing volumes of genomic data requiring large and collaborative computing resources to help process it quickly and at scale. We have some of the largest computational platforms for life sciences in Europe and the demand for our computing capability is only increasing, putting pressure on the capacity and operational costs of our existing data centers." Dr Timothy Stitt, Head of Scientific Computing, Earlham Institute

If you are a research, academic or scientific organisation working with HPC and looking for a cost-effective, scalable, secure data center solution along with world class technical support, then speak to us at Verne Global.



As part of our continuous improvement programme we are looking at efficient ways to deliver world leading science; working with Verne Global we aim to deliver the same services, at a better cost, while improving our business continuity for data centers.



Sarah Cossey
Director of Operations,
Earlham Institute