Solution Brief

Xeureka Accelerates Collaborative Drug Discovery With Confidential Computing

Securely combining siloed and confidential datasets for clinical advancements.

Improving Drug Discovery While Keeping Data Confidential

Mitsui founded Xeureka to lower the costs of drug discovery and accelerate drug development. They recently collaborated with five different pharmaceutical companies in a confidential computing environment to leverage AI and large language models (LLMs), which are incredibly effective at deriving insights from massive datasets. Due to the highly confidential and sensitive nature of the pharmaceutical research data, in addition to the proprietary models used, it was critical to comply with global privacy regulations when using the data. Xeureka needed to figure out how to pool data from multiple stakeholders and maintain the confidentiality of the data, while using it in AI models to power research.

A Platform for Secure Collaboration

Fortanix provides the platform that enables organizations like Xeureka to manage security policies and orchestrate the use of highly confidential data in a secure environment. The platform offers several key benefits:

- **Data sharing and access control** enable fast, collaborative data processing without revealing sensitive information.
- **A key management system** ensures unified encryption workflows across a hybrid multi-cloud environment, regardless of the data's location.
- **Workflow management** helps to define, manage, and track data collaboration along with privacy and security guardrails.

Building a Proof of Concept Around Confidential Computing

To address computational and security challenges, Xeureka partnered with Fortanix and NVIDIA on a proof of concept that can integrate datasets from multiple sources while maintaining security and confidentiality of the original data sources.

The solution is based on confidential computing, a way of processing data in a protected zone of a computer's processor and proving that no one viewed or altered the work. Xeureka chose Fortanix to deliver their NVIDIA-powered confidential computing solution.

Key Points

- R&D costs are high, averaging $1–$2 billion per new drug
- Success rates are low, below 1% on average
- Development lead times are long, averaging 10 years per new drug
- Xeureka's solution Improved model accuracy from 65 percent to 74 percent, reducing the time and costs associated with drug discovery

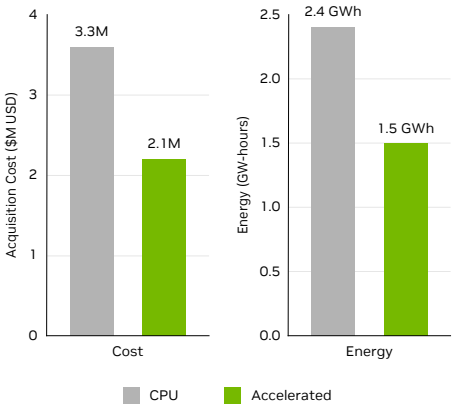

Figure 1. Energy and cost savings in life sciences on GPUs.

Based on alignment of both tumor and normal whole-genome samples, Illumina sequenced to 53X coverage tumor and 25X coverage normal.

CPU-only (blue) = 256x CPUs (AMD 7713 Milan).

With GPU (green) = 8x NVIDIA A100 Tensor Core GPUs in NVIDIA DGX™ where possible.

This combination of NVIDIA hardware and software enabled Xeureka to not only drastically reduce analysis runtimes but also significantly cut energy consumption per computation. This saves Xeureka considerable time—so they can run more analyses and get to results faster—and decreases the environmental impact and energy cost that would normally be required to run analysis at this scale.

Achieving Data, Algorithm, and Model Safety

The combined solution allows Xeureka to train and evaluate AI models while ensuring that data, algorithms, and AI models are all protected from unauthorized access, external attacks, and insider threats. The solution:

- Protects the privacy and confidentiality of data in use, even when shared with different parties, while rapidly processing the high volumes of data required by the AI models
- Securely processes these high volumes of data without noticeable degradation of processing speed
- Enables Xeureka and partners to define, manage, and track data collaboration with privacy and security guardrails.
- Provides zero-trust integrity verification and auditable transaction records for confidential computing GPU resources and deployed AI models
- Prevents potential harm through use of high-risk datasets and trained models for unauthorized or criminal purposes

The result is a solution that can play a crucial role in Xeureka's vision to use AI to improve both the effectiveness and efficiency of new drug development, accelerating time to market and improving the lives of millions of consumers across the globe.

By enabling confidential data collaboration, Xeureka improved model accuracy from 65 percent to 74 percent, reducing the time and costs associated with drug discovery.

Ready to Get Started?

To learn more, visit at **Fortanix Confidential Computing** and at **Xeureka Confidential Computing Press Release**

NVIDIA