

Lenovo GOAST 4.0 decodes Trillions of Cells, accelerating Genome Analysis to 24 Minutes

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Breakthrough high-performance computing solution delivers 3x higher throughput, cost efficiency, and faster life-saving discoveries



Lenovo shared updates on the 4th generation of its Genomics Optimization and Scalability Tool –**GOAST v4.0**. Since its introduction in 2020, GOAST has been advancing genome sequencing across industries including pharma, healthcare, agriculture, and drug discovery. The latest version reduces genome processing to as little as 24 minutes per whole genome sequence, with a single node capable of processing **~22,000 genomes annually**, nearly triple the throughput of earlier releases. With each human genome comprising around **3 billion DNA base pairs**, GOAST v4.0 is literally decoding trillions of cells to power breakthroughs in science and medicine.

By cutting genome analysis from days to minutes, GOAST v4.0 empowers researchers, clinicians, and pharma companies to accelerate precision medicine, cancer research, drug discovery, and national health programs. Delivering GPU-level performance on optimized CPUs at up to **50% lower cost**, GOAST makes high-throughput genomics accessible to institutions of all sizes through Lenovo's pay-as-you-go High-Performance Computing (HPC)-as-a-Service model, TruScale.

"GOAST v4.0 breaks bioinformatics bottlenecks by combining Lenovo's HPC expertise with genomics innovation," said **Sumir Bhatia, President, Lenovo ISG Asia Pacific**. "With this leap in performance and efficiency, we are enabling real-time discoveries that can save lives and advance global health equity."

Key Advancements with GOAST v4.0

- **Speed:** Genome processing cut from 68–150 hours to just 24 minutes, a 375x improvement.
- **Throughput:** Up to ~22,000 genomes processed per node annually, supporting population-scale genomics.
- **Affordability:** GPU-level performance at significantly lower cost.
- **Accessibility:** Pay-as-you-go Lenovo TruScale HPC-as-a-Service, lowering barriers for labs and public health agencies.
- **Sustainability:** Water-cooled HPC systems reduce power consumption by up to 40%.

GOAST is already in use at leading institutes worldwide, including the **Council of Scientific and Industrial Research – Institute of Genomics & Integrative Biology (CSIR-IGIB)** and **University of Delhi in India, BRIN (Indonesia)**, Novo Genomics (Saudi Arabia), and the **Biobank of Thailand**. A leading children's hospital in **Australia** is deploying GOAST to scale its genomics research, while pharma companies in the **Philippines** are investing in high-performance computing, pointing to growing opportunities for GOAST in new markets. In India, multiple pharma companies are using GOAST to optimize cancer research, accelerate drug discovery, and improve treatments, showcasing its transformative impact across the healthcare ecosystem.

Beyond genomics acceleration, GOAST also demonstrates how AI and HPC together are enabling downstream innovations, from smarter algorithm design to more precise bioinformatics workflows, further strengthening its role as a platform for next-generation precision health.

Lenovo's unique advantage lies in its ability to bring healthcare experts, scientists, and medical researchers together with HPC hardware and software engineers, creating multi-layered platforms like GOAST that deliver both speed and scientific depth, all focused on *solving humanity's greatest challenges*.

As part of Lenovo's **Smarter AI for All** vision, GOAST v4.0 combines the best of HPC and AI to accelerate scientific breakthroughs, making genomics research faster, more cost-effective, and globally accessible.