Lenovo Genomics Optimization and Scalability Tool (GOAST)

Accelerate Drug Research and Discovery with Lenovo's Genomics Solution

Genomic data is fueling drug development innovation for the life sciences industry, but processing this data requires a large investment in time and resources. High-performance, scalable, and flexible tools are essential for accelerating time to market and boosting revenue in a highly competitive landscape. The Lenovo Genomics Optimization and Scalability Tool (GOAST) is optimized for performance, usability, and cost — supporting the advancement of the lab of the future.

GOAST enables clinical researchers and developers to increase lab productivity, expedite data processing, and maximize profitability by:

- Running faster sequential workflows that require high-core, high I/O, or high memory
- Using computational resources as efficiently as possible without cost-prohibitive GPUs and FPGAs or other specialty hardware
- Reducing the cost of analysis and the cost-per-genome equivalent

GOAST for pharmaceutical research and development

Reducing execution time cost-effectively is a big challenge when you're running multiple workflows, going through many steps with open-source software, and analyzing massive amounts of data. GOAST wraps different workflows into one user-friendly, optimized tool — including standard workflows for variant calling in genome sequencing.

GOAST delivers **27x to 40x performance improvement** compared to typical runtimes at genomics datacenters around the world.

Top Use Cases

Predictive testing: Determine the causal mutations for a specific disorder

Diagnostic testing: Confirm or rule out a suspected genetic disorder prior to treatment

Pharmacogenomic testing: Determine how patients respond to a drug based on the underlying molecular mechanisms

GOAST performance **scales linearly from single-node appliance to cluster implementation** to serve the needs of labs of all sizes. This scalable solution enables you to start research on workstations and scale up to a bigger CPU cluster as your needs grow.

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PLATINUM

Scale your genomics research with the GOAST high-performance reference architecture

The GOAST reference architecture leverages non-specialty hardware, system optimization, and the Broad Institute's open-source Genome Analysis Toolkit (GATK) software to deliver an affordable and scalable solution that improves peak performance.

The GOAST recipe combines high-performance architecture with a high-performance scaler solution to:

- Provide the best hardware, software, and workflow combinations optimized for performance, cost, and usability

- Enable you to use both open source and your own proprietary software on hardware-agnostic workstations

- Allow you to fully customize your architecture to your own mix of workloads, analyses workflows, storage needs, and research types

Advance beyond workstation CPUs and GPUs

Lenovo GOAST solutions are validated, preconfigured, and built on reliable, high-performance Lenovo ThinkSystem servers. Powered by 4th Gen Intel® Xeon® processors, they allow researchers to analyze an entire human genome in 42 minutes and whole exomes in seconds.

- Specially tuned hardware that accelerates the open-source GATK software

- Preconfigured software to maximize the architecture performance

- Flexibility to install any other bioinformatics or high-performance computing tools
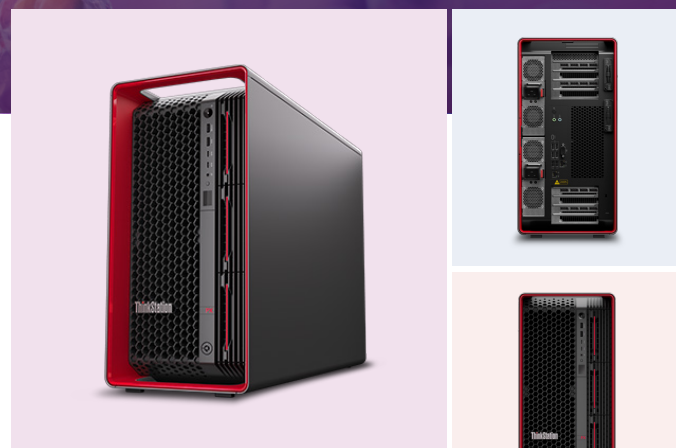
Lenovo ThinkStation PX

Lenovo's ideal workstation for GOAST and complex research workflows

Supports up to:

- 4th Gen Intel® Xeon® Scalable processors

- 4x NVIDIA RTX 6000 Ada Generation

- 2TB, 16 DDR5 DIMM slots

- 7 drives (4x 3.5" SATA HDD + 3x M.2 SSD) or 9 drives (2x 3.5" SATA HDD + 7x M.2 SSD)

Includes Lenovo ThinkShield security and Intel® hardware-based protection

Lenovo GOAST Intel® Base

Best option for price performance

- 1x ThinkSystem SR630

- Processor: 2x Intel® Xeon® Platinum 8480+ (56 cores, 350W, 2.0 GHz)

- Memory: 1TB RAM (suggested)

- Storage: 7TB local + network storage

- Can process up to 29 WGS samples per node per day

ThinkSystem SR630 V2 Rack Server

Engineered to deliver performance, reliability, and security for data analytics, hybrid cloud, and HPC.

Optimize, scale, and accelerate your analytics with Lenovo

- **Optimize multiple workflows:** Lenovo ThinkStation and ThinkSystem allow researchers and data scientists to optimize software for critical workflows that include genomics, transcriptomics, molecular dynamics, and CryoEM.

- **Support high-throughput volumes:** Accommodate needs ranging from a single research lab (single sequencer) to population-level efforts (hundreds of thousands of genomes per year).

- **Scale modularity:** Prioritize performance and affordability with scalable configurations.

- **Rapidly process and evaluate data:** Lenovo GOAST is up to 40X faster than standard environments, enabling more samples to be processed and speed up information to achieve insights faster.

- **Enable multipurpose bioinformatics use:** Leverage BOSS' high-core, fast I/O, and high-memory specs to run any bioinformatics or HPC tools or scripts.

- **Save costs:** GOAST systems cost up to 50% less than similar boutique solutions relying on GPUs or FPGAs, while eliminating additional licensing fees.

- **Integrate and customize easily:** GOAST systems can be integrated into new or existing clusters and fully customized from an architecture, system, or software perspective.

Access to reliable, high-performance computing (HPC) solutions **powered by Intel® Xeon® Scalable processors** helps accelerate scientific research and discovery to meet and solve current and future challenges.

Trusted technology partner

Leading life sciences companies choose Lenovo as a trusted technology partner due to our customizable solutions, reliability, and trusted supply chain.

We offer:

- A portfolio of sustainable computing solutions for creating and increasing capacity of on-prem data center, edge hardware, and services through a dedicated AI-ready source

- Ability to easily scale and grow your technology while staying ahead of your industry trends thanks to faster bioinformatics data analysis with Lenovo TruScale

- End-to-end, best-in-class solutions including data center and workstations solutions

Ready to build the lab of the future and accelerate time to breakthrough?

Partner with Lenovo and Intel® to accelerate workflows and plan your HPC resources more effectively to meet the increasing demands of future genomic research.

Contact your Lenovo Health account representative or local business partner. Visit **lenovo.com/healthcare**

Smarter technology for all