Government

Unlocking new insights into serious diseases

Government agency in Korea

To help it cost-effectively sequence the genomes of one million Koreans, this government agency is harnessing the Lenovo Genomics Optimization And Scalability Tool (GOAST) architecture—based on Lenovo ThinkSystem SR950 servers powered by Intel® Xeon® Scalable processors.

intel XEON PLATINUM

Powered by up to 4th Gen
Intel® Xeon® Scalable processors

Lenovo

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Who is this Korean government agency?

This government agency in Korea supports the advancement of public health. It aims to build a population health and genetic data hub—collected through voluntary participation—that will empower researchers to predict and diagnose diseases to which Koreans are particularly susceptible.

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The Challenge

In total, the government agency plans to sequence the genomes of one million Koreans. The organization has already recruited more than 15,000 volunteers to provide DNA samples for sequencing, including people with rare diseases and their families.

A spokesperson elaborates: “By building a rich set of genomic data including people with serious diseases as well as the general public, we aim to contribute to earlier and more accurate detection of diseases and more effective therapies.”

To reach its target of one million genomes, the organization plans to ramp up its sequencing efforts significantly in the years ahead. However, its previous genomic data platform made scaling up costly and complex.

“Our previous genomic data platform could only process a limited number of samples in parallel, which was a significant performance bottleneck,” explains the spokesperson. “However, an even bigger challenge was that our monthly software licensing costs for the platform were based on the number of individual analytics jobs we performed. In the long run, we knew that sequencing all one million genomes on the platform would be prohibitively costly. To continue our ground-breaking work, we looked for a new approach.”

> **“We are driving a population-scale genomics project that requires us to analyze massive volumes of data. With Lenovo and Intel, we’ve found a highly cost-effective way to process that data at speed and scale.”**
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> **Spokesperson**
> Government agency in Korea

Enabling sequencing at national scale

When the organization discovered Lenovo's Genomics Optimization and Scalability Tool (GOAST), it immediately recognized the solution's potential to transform its approach to genomic sequencing. Jointly developed by Intel and Lenovo, GOAST is an open-source solution that accelerates genomics analysis while keeping costs lean.

"We first became aware of Lenovo GOAST at an industry conference, and were very impressed by its robust, cost-effective architecture," recalls the spokesperson. "Unlike our previous solution, Lenovo GOAST has no ongoing licensing costs—you simply purchase a single stack of hardware and software, and then you can sequence as many samples as you wish. The solution also supports a far greater number of data pipelines, allowing us to significantly accelerate our sequencing efforts."

Hardware

Lenovo ThinkSystem SR950 powered by Intel® Xeon® Scalable processors

Software

CentOS
Lenovo Genomics Optimization and Scalability Tool (GOAST)

Services

Lenovo HPC Services
Lenovo Remote Technical Support
Lenovo Warranty Upgrade

Working with Lenovo, the organization deployed the GOAST solution at its primary data center. Based on Lenovo ThinkSystem SR950 servers powered by high-performance Intel® Xeon® Scalable processors, the solution's eight-socket CPUs are finely tuned for genomics workloads, combining excellent performance with high availability. The GOAST solution runs on the open-source CentOS operating system, contributing to overall reliability and ease of management.

"While we considered a number of solution vendors, none of them could match the speed and cost-efficiency of Lenovo GOAST."

Spokesperson
Government agency in Korea

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Results

Although the organization's journey with Lenovo GOAST is just beginning, the solution is already having a positive impact on its work.

"Deploying Lenovo GOAST—powered by Intel® Xeon® Scalable processors—is a low-cost, high-speed way to boost sequencing capacity," confirms the spokesperson. "We estimate that sequencing is now around 20 times faster.[1] Not only can we now process more samples in parallel, but we can also do it at a significantly lower cost. That will make a big difference as we move towards our goal of one million genomes."

- **20x faster genome sequencing[1]**
- **Cuts costs for population-scale genomics**
- **Long-term product roadmap**

[1] Data provided by the government agency in Korea

Looking ahead, Lenovo GOAST will play a crucial role in supporting predictive and personalized medicine for people across Korea.

“With Lenovo GOAST, we can quickly and easily analyze huge amounts of genomic data,” says the spokesperson. “One of the aspects of the solution we appreciate most is the long-term roadmap: Lenovo and Intel are committed to improving the solution. For example, Lenovo has recently augmented the solution’s whole-genome sequencing capabilities with support for RNA-seq, single-cell sequencing, and somatic analytics pipelines.”

“With Lenovo and Intel, we’ve built a powerful population genomics platform that will enable us to sequence one million genomes rapidly and within budget—contributing to better public health outcomes for people across Korea.”

Spokesperson
Government agency in Korea

Why Lenovo?

To prove the concept, Lenovo provided the organization with a demo deployment of Lenovo GOAST. Following an in-depth evaluation over three months, the team was convinced that the solution was the optimal fit for its analytics use cases.

“Deploying Lenovo GOAST into production was very fast and straightforward,” says the spokesperson. “Working closely with experts from Lenovo HPC Services, we built the new genomics pipelines and moved our sequencing workloads over to the new platform.”

Ever since the organization went live with the new solution, Lenovo has been on hand to provide technical support and guidance.

“We really appreciated that Lenovo worked closely with us to tune Lenovo GOAST for maximum performance,” adds the spokesperson. “The excellent support we’re receiving from Lenovo is one of the main reasons I’m so happy with the solution overall—they’re always ready to help when we need them.”

How do you sequence more than one million genomes?

Processing more samples in parallel at lower cost with Lenovo and Intel® technology.

Explore Lenovo GOAST

Powered by up to 4th Gen Intel® Xeon® Scalable processors