



Accelerate Genomic Analysis with Lenovo PX and NVIDIA Parabricks

The universal genomic analysis workstation.



The Importance of Speed in Genomic Analysis

The field of genomics is growing exponentially, transforming the healthcare, agriculture, and life sciences industries. The introduction of next-generation sequencing (NGS) in 2005 produced a data explosion and created new industries built around the human genome, from discovering new variants to developing precision-based therapeutics.

Today, commercially available, high-throughput genomics platforms can sequence hundreds of whole genomes per week. As instrument throughputs have exploded, the cost of sequencing has dropped, and sample prep and data analytics have become a proportionally larger share of the cost. As healthcare and life sciences organizations use the genome to understand disease, discover drugs, and enhance patient care, data analysis and management are becoming the main tools for extracting the genome's value.

GPUs can accelerate the entire analytics workflow, and with Parabricks on the Lenovo ThinkStation PX workstation, genetic variants can be uncovered in a matter of minutes, instead of the hours or days a CPU-based workflow takes.

Powering Fast, Accurate Analysis with NVIDIA Parabricks

NVIDIA Parabricks is a scalable genomics analysis software suite that brings unparalleled speed, accuracy, and throughput to the rapidly evolving field of genomics. It harnesses the power of GPU-accelerated computing to reduce the runtime of data processing from days to mere minutes, enabling researchers to spend less time waiting and more time making strides in understanding and treating disease. As the only GPU-accelerated solution compatible with all leading sequencing instruments, Parabricks caters to various applications, ranging from genomes to exomes, germline to somatic, and DNA to RNA. More importantly, it provides equivalent results to the open-source tools that it accelerates. Parabricks also incorporates AI into genomics workflows and offers an optimized platform for deep learning, ensuring high accuracy and customization. Moreover, it stands out as a cost-effective and space-saving solution, making it ideal for large-scale sequencing centers and genomics projects.

Parabricks on the Lenovo ThinkStation PX



Universal Analysis: Industry-standard tools for all major sequencers, ported to GPU



High Speed: Up to 100X faster for WGS compared to CPU-only solutions



Low Cost: Up to 50% lower compute cost for WGS compared to CPU-only solutions



High Accuracy with AI: Utilize the power of deep learning for customized, high-accuracy analysis with DeepVariant

Parabricks on the Lenovo ThinkStation PX

- > Up to four NVIDIA RTX 6000 Ada Generation GPUs
- > Up to 60 Tensor Cores
- > Up to 2TB DDR5 memory
- > Superfast NVME storage

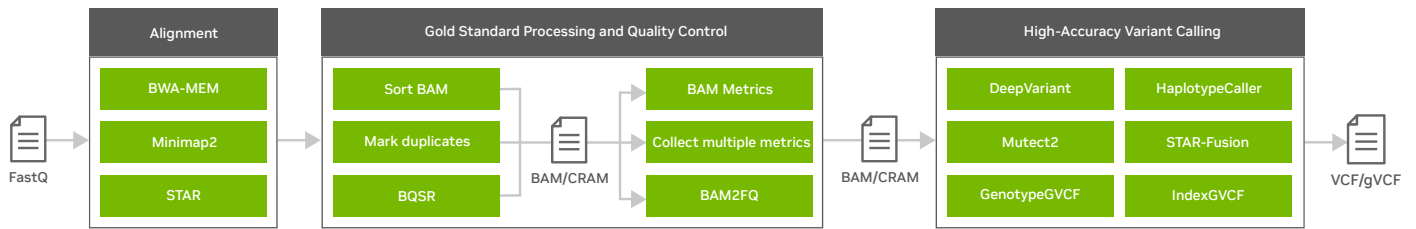


Figure 1. NVIDIA Parabricks GPU-accelerated tools for short-read and long-read applications.

Deploy with Flexibility and Efficiency on the Lenovo ThinkStation PX

Designed with modern health researchers and clinicians in mind, Lenovo Workstations offer professional performance for the innovation of tomorrow, and the Lenovo ThinkStation PX represents the pinnacle of healthcare performance. Featuring a thermally advanced, rack-optimized chassis, this powerhouse runs the most complex clinical and research workloads seamlessly. The ThinkStation PX has been validated and tested for Parabricks and can be configured with up to four NVIDIA RTX 6000 Ada Generation GPUs.

Running on a single ThinkStation PX, Parabricks can provide throughput of up to 90 30x whole genomes per day, comparable to 110 CPU servers, reducing IT management overhead and operating costs (including power and cooling). Additionally, with **NVIDIA AI Enterprise**, organizations receive full access to NVIDIA Enterprise Support, which provides guaranteed response times, priority security notifications, and access to Parabricks experts to troubleshoot and optimize genomics workflows.

Parabricks Benchmarks on PX

ThinkStation PX Performance Comparison
Germline End-To-End Analysis

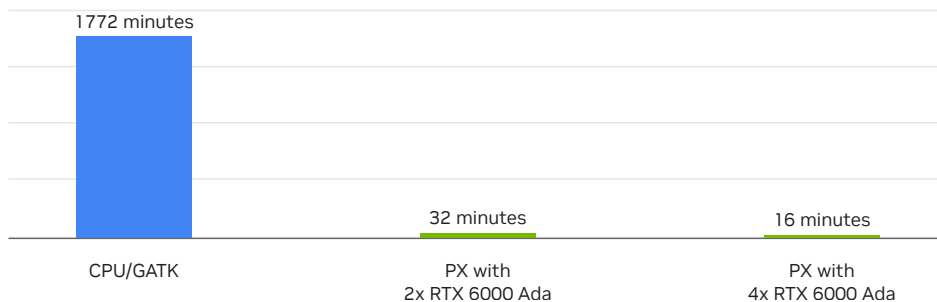


Figure 2. Data generated using genome-in-a-bottle HG002 whole genome at 30X coverage. Native GATK numbers were generated using 96x vCPU and 384GB RAM. Parabricks numbers on the PX were generated using 2x 8480+ CPUs and 256GB RAM in addition to the 6000 Ada GPUs.

Ready to Get Started?

To learn more about NVIDIA Parabricks, visit:

www.nvidia.com/clara-parabricks

To learn more about Lenovo's healthcare offerings, visit:

www.Lenovo.com/Health