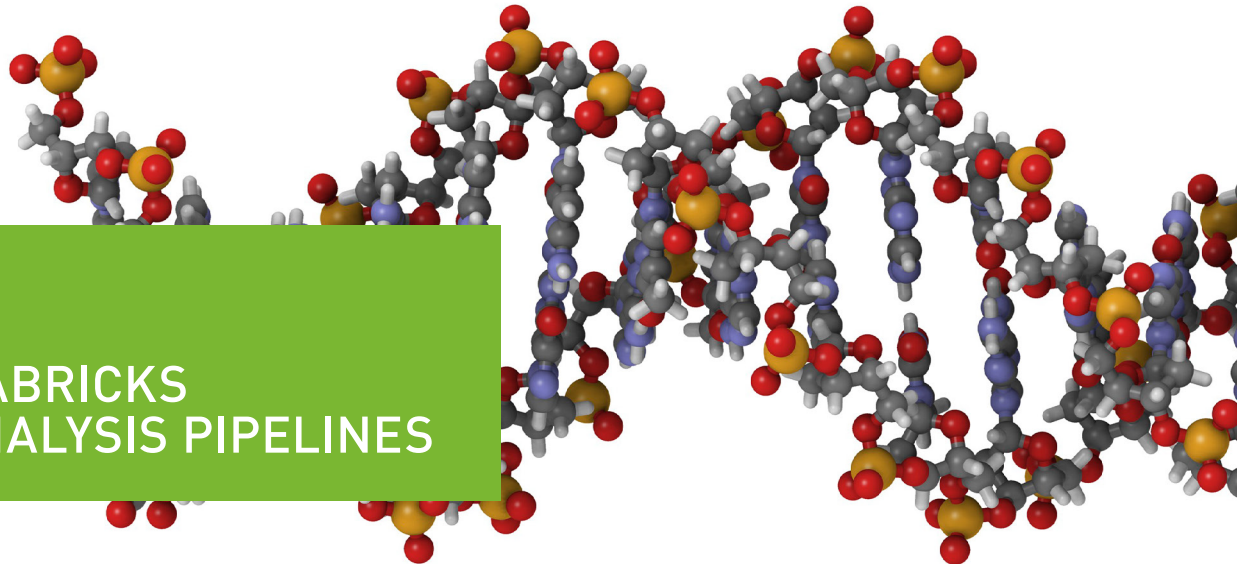


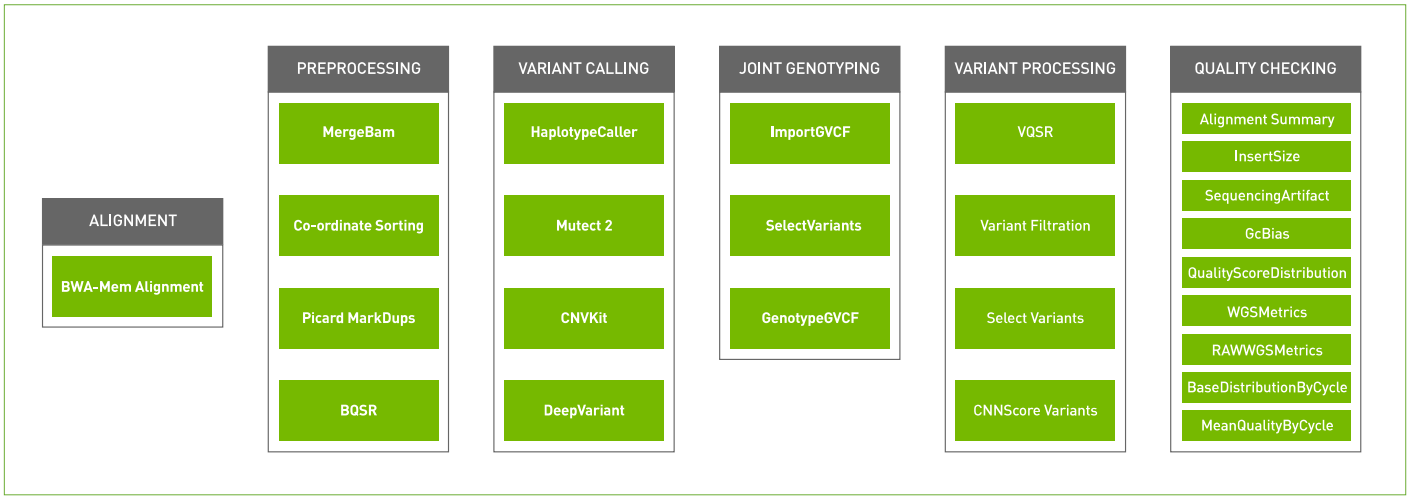
NVIDIA PARABRICKS GENOMIC ANALYSIS PIPELINES

NVIDIA Parabricks provides 30-50 times faster secondary analyses of sequencer-generated FASTQ files to variant call files (VCFs). Additionally, Parabricks achieves equivalent results to that of common secondary analysis tools like GATK4 and DeepVariant, while increasing throughput significantly.

Providing Unmatched Secondary Analysis Performance and Throughput

Parabricks uses graphics processing units (GPUs) to accelerate secondary data processing. Current analyses take nearly 30 hours of computation on a 32-vCPU machine. Parabricks accelerates these computations, completing analyses in 45 minutes on an 8 GPU machine, while implementing the exact same algorithms as GATK4. Parabricks can run the full GATK4 best practices, but it's also fully configurable. As a result, you can choose which steps and which versions of the pipeline to run.

NVIDIA Parabricks Accelerated Tools



The Parabricks Advantage

HIGH THROUGHPUT
On a single server, Parabricks' software can process up to 40 whole genomes per day

30
50 TIMES FASTER
By running 30–50 times faster, Parabricks can reduce computing costs up to 50% compared to CPU-only solutions.

BETTER ACCURACY
No need to sacrifice accuracy for reducing turn-around time. Deep-learning based tools accelerated by Parabricks increase accuracy.

DETERMINISTIC REPRODUCTIBLE
Any configuration of Parabricks software on any platform generates the exact same results every time for a given input.

FLEXIBLE PIPELINE
Create customized accelerated pipeline by connecting Parabricks' tool in a configurable way.

AI AND ML INTEGRATION
GPU ecosystem is designed for deep learning and integrates with state of the art AI and ML frameworks and libraries instantly.

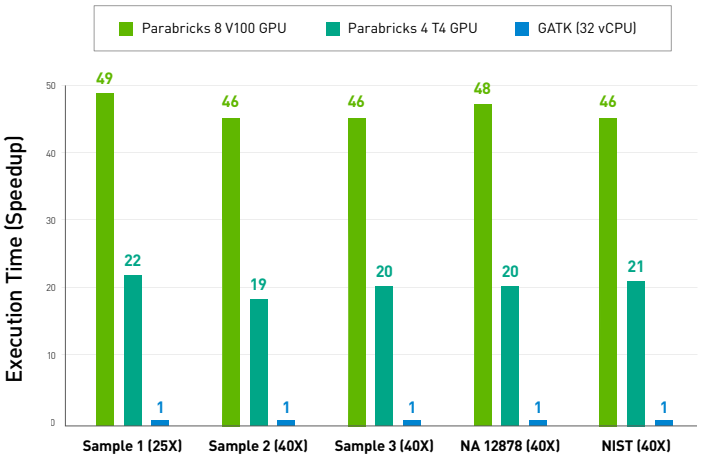
Reduced Computing Costs

By using GPU-accelerated computing, Parabricks can provide throughput comparable to nearly 40-50 CPU servers with one GPU server, reducing IT management overhead and operating costs (including power and cooling). Whether it's analysis or re-analysis of NGS data, Parabricks is rapidly evolving as a preferred solution, providing current pipelines with vast improvements in terms of efficiency, while also enabling user-driven customization.

For users on the cloud, computing costs are proportional to execution time. By reducing runtime by a factor of 30-50X, Parabricks reduces total computing costs by up to 50% compared to CPU-only solutions.

PERFORMANCE COMPARISON

Germline End to End Secondary Analysis



High-Performance Solution

The output BAM file after Alignment, Sorting, Marking Duplicates, and Apply BQSR stage is identical to the baseline. The baseline variant caller is nondeterministic and can generate slightly different results based on certain parameters. For this step, the result generated by Parabricks software is within 99.999% of the baseline execution.

NVIDIA GPU RECOMMENDATIONS	
Optimized for scale out performance	NVIDIA T4
Optimized for fastest turn around time	NVIDIA V100

SUPPORT FOR AN ANNUAL PER NODE LICENSE	
Full access to all pipelines in the NVIDIA Parabricks software suite	✓
No limitations on the number of genomes analyzed	✓

Learn more at www.developer.nvidia.com/nvidia-parabricks